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ABSTRACT

The following papers are included: "Consortia and Collaborative Research: Getting Started" (Hansen); "Coordination of the Health Care System in the State of Michigan" (Burian, Boyden, Herbert); "Health Promotion and Disease Prevention in Allied Health" (Doiron, Douglas); "Interprofessional Collaboration in the Analysis of Public Policy" (Dunn); "Surveying Research Interests of Allied Health Professionals" (Schiller); "Interprofessional Education and Attitude Change" (Casto, Nystrom, Burgess-Ellison); "Professional Team Building as a Curricular Experience" (Von Son, Bailey); "Role-Modeling Health Promotion and Disease Prevention for Medical Laboratory Personnel" (Cornish); "Perceived Continuing Education Needs of Allied Health Department Heads" (Brunner); "Home Peak Flow Monitoring in the Asthmatic Child" (Samson, Gentlesk); "Collaborative Research on the Treatment and Prevention of Hymolytic Disease of the Newborn" (Waheed et al.); "Prospective Study of Number Eight French Feeding Tubes in the Clinical Setting" (Snyder, Horvath, Senchak); "Serological Studies on the Red Cells of a Gorilla Family" (Unsicker et al.); "The Living Laboratory: An Allied Health Collaboration with Architecture and Engineering" (Sultz); "A Model for Rural Elderly Health Needs Assessment" (Allen); "Cost Containment Strategies for the Laboratory and Their Effect on Sample Volume" (Lehman, Leiken, Fass); "Responding to the Challenges of Tomorrow: Changes in the Dissemination of Clinical Information" (Sevel); "Evaluation of Pre-treatment Fixation on the Indirect Avidin-Bioton Immunofluorescence Test for Platelet Antibodies" (Jaskowiak, Kennedy); "Evaluation of an Indirect Avidin-Biotin Complex Immunofluorescent Assay for Platelet Antibodies" (Lafrado et al.); "Critical Factors Associated with Substance Abuse and Chemical Dependency among Nurse Anesthetists" (Norris); "Occupational Therapy Intervention with Down's Syndrome Children" (Prendergast); "Platelet Utilization Review" (Waheed et al.); "Analysis of the Effects of Inhaled Diesel Exhaust on the Alveolar Intravascular and Interstitial

Cellular Components of Rodent Lungs" (Wallace, Salley, Barnhart); "Graft Versus Host Disease and Lymphocytotoxic Antibodies in Bone Marrow Transplant Patients" (Williams et al.); and "Discussion and Planning for an Allied Health Research Consortium" (Snyder). (MN)

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COLLABORATIVE RESEARCH IN ALLIED HEALTH

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SCHOOL OF ALLIED MEDICAL PROFESSIONS
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COLLABORATIVE RESEARCH IN ALLIED HEALTH

Proceedings of

Collaborative Research In Allied Health Symposium

School of Allied Medical Professions
THE OHIO STATE UNIVERSITY
Columbus, OH

September 20, 1985

EDITOR
M. Rosita Schiller, Ph.D., R.D.

ASSOCIATE EDITORS
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PREFACE

A recent issue of the Chronicle of Higher Education* carried a news item: FEARS OF COLLABORATION AMONG SCIENTISTS EXAMINED. The article described the first collaborative study which was conducted in 1670. This momentous event, sponsored by the Paris Academy, featured simultaneous solar observations, from Paris and from Cayenne, French Guinea, to determine the distance of the sun from the earth. Cooperation was essential for such an experiment. The work required that these scientists disregard the common belief that cooperation would endanger scientific investigation by stifling individual originality.

This joint activity, and the sequence of observations which followed, fueled mutual interests and sparked the desire to share current information. As a result, international solar-physics societies were established and journals were initiated to disseminate findings and to stimulate further studies. The fear of collaboration slowly dissolved and, by the late 19th century, cooperation was finally given legitimacy within the community of scholars.

Cooperation among researchers has become commonplace. The dangers of collaboration are no longer questioned. Shared research is not only accepted, it is encouraged.

In recent years, research in the allied health professions has become a priority issue across the nation. Educators and practitioners alike are challenged to investigate effectiveness and efficiency in teaching and the delivery of health care services. These studies can be facilitated by that same cooperative spirit which surrounded the simultaneous explorations of the solar system.

This Symposium was, therefore, organized to promote the development of research consortia and to strengthen interinstitutional and interdisciplinary research in allied health. The purpose of the symposium was to: provide a forum for sharing collaborative research, help establish linkages for interinstitutional and interdisciplinary research, and stimulate new efforts in allied health research.

These proceedings are offered to foster and facilitate collaborative research beyond the Symposium.

M. Rosita Schiller
John R. Snyder

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*August 14, 1985, p. 6

TABLE OF CONTENTS

Symposium Schedule 1
Poster Sessions 4
Research Awards 5

KEYNOTE ADDRESS

CONSORTIA AND COLLABORATIVE RESEARCH: GETTING STARTED
Barbara Hansen 7

PART I - RESEARCH RELATED TO GLOBAL ISSUES IN ALLIED HEALTH 15

Coordination of the Health Care System in the State of Michigan
William Burian, Kathryn Boyden and Patricia Herbert . . 17

Health Promotion and Disease Prevention in Allied Health: An Interdisciplinary and Interinstitutional Approach to Research and Change
Wilfrid F. Doiron and Priscilla D. Douglas 21

Interprofessional Collaboration in the Analysis of Public Policy: Methods, Process and Product
Van Bogard Dunn 32

Surveying Research Interests of Allied Health Professionals
M. Rosita Schiller 36

PART II - RESEARCH RELATED TO EDUCATON OF ALLIED HEALTH PROFESSIONALS 49

Interprofessional Education and Attitude Change: Research Design and the Collaborative Process
R. Michael Casto, Eleanor P. Nystrom and James A. Burgess-Ellison 51

Professional Team Building as a Curricular Experience
L. George Van Son and Susan Pritchard Bailey 58

Role-Modeling Health Promotion and Disease Prevention for Medical Laboratory Personnel: A Pilot Program
James P. Cornish 63

Perceived Continuing Education Needs of Allied Health Department Heads
Marjorie L. Brunner 71

PART III - CLINICAL RESEARCH STUDIES 81

Home Peak Flow Monitoring in the Asthmatic Child
Linda F. Samson and Michael J. Gentlesk 83

Collaborative Research on the Treatment and Prevention of Hymolytic Disease of the Newborn
Abdul Waheed, P.L. Strohm, M.S. Kennedy,
R. O'Shaughnessy, J. Iams and L. Cordero 88

Prospective Study of Number Eight French Feeding Tubes in the Clinical Setting
Diane M. Snyder, Margaret C. Horvath and
Michael Senchak 91

Serological Studies on the Red Cells of a Gorilla Family
Laurie J. Unsicker, A. Waheed, M.S. Kennedy
and Margaret D. Snyder 104

PART IV - MANAGEMENT RELATED RESEARCH 109

The Living Laboratory: An Allied Health Collaboration with Architecture and Engineering
Harry A. Sultz 111

A Model for Rural Elderly Health Needs Assessment: Methodology and Results
Virginia R. Allen 112

Cost Containment Strategies for the Laboratory and their Effect on Sample Volume
Craig A. Lehman, Alan M. Leiken and Joel Fass 123

Responding to the Challenges of Tomorrow: Changes in the Dissemination of Clinical Information
Francine Sevel 127

POSTER SESSIONS 135

Evaluation of Pre-Treatment Fixation on the Indirect Avidin-Biotin Immunofluorescence Test for Platelet Antibodies
D.W. Jaskowiak and M. Kennedy 137

Evaluation of an Indirect Avidin-Biotin Complex Immunofluorescent Assay for Platelet Antibodies
L. Lafrado, M.S. Kennedy, M.A. Williams,
P. Stanton, S.E. Tuttle and A. Waheed 139

Critical Factors Associated with Substance Abuse and Chemical Dependency among Nurse Anesthetists
Jack Norris 141

Occupational Therapy Intervention with Down's Syndrome Children: A Pilot Study
Nancy D. Prendergast 142

Platelet Utilization Review: A Rational Approach
A. Waheed, M. Williams, R. Reed, K. White, L. Hazy A. Winterstein, K. Skidmore and A. May 144

Analysis of the Effects of Inhaled Diesel Exhaust on the Alveolar Intravascular and Interstitial Cellular Components of Rodent Lungs
M. Ann Wallace, Steven O. Salley and Marion I. Barnhart 146

Graft Versus Host Disease and Lymphocytotoxic Antibodies in Bone Marrow Transplant Patients
M. Williams, K. Hunt, T. Myser, M. Steedman, M.S. Kennedy, P.J. Tutschka, E. Copelan, L. Hazy, A. Winterstein, K. Skidmore and A. May 149

EPILOGUE: DISCUSSION AND PLANNING FOR AN ALLIED HEALTH RESEARCH CONSORTIUM
John R. Snyder 151

APPENDIXES 155

A. Interview Format/Data Collection Instrument 157

B. Life Management Self Evaluation Test 160

C. Instrument for Survey of Clinical Affiliation Sites . . 164

D. Survey of Research Interests of Clinical Dietitians . . 166

E. Speech Language Pathology and Medical Record Administration Joint Project Questionnaire 170

F. Health Promotion and Disease Prevention - WCMH Laboratory Project Consent Form 172

G. Laboratory In-Service Education 173

H. Bibliography: Computers and Informatics in Health Care and Education 174

LIST OF PARTICIPANTS: COLLABORATIVE RESEARCH IN ALLIED HEALTH . . 180

THE OHIO STATE UNIVERSITY
SCHOOL OF ALLIED MEDICAL PROFESSIONS

Collaborative Research in Allied Health Symposium
September 20, 1985

SCHEDULE

8:00	Registration and Coffee	
8:30	Introductions	John R. Snyder, Ph.D.
	Welcome	Stephen L. Wilson, Ph.D.
	Moderator	John R. Snyder, Ph.D.
8:40	Incentives for Coordination in the Statewide Health Care System: A Key Informant Survey	**WILLIAM BURIAN, PH.D.** **KATHRYN BOYDEN** College of Health and Human Services Western Michigan University Kalamazoo, MI
9:00	Health Promotion and Disease Prevention in Allied Health: An Interdisciplinary and Interinstitutional Approach to Research and Change	**WILFRID F. DOIRON, PH.D.** School of Allied Health The Univ. of Connecticut Storrs, CT
9:20	Interprofessional Collaboration in the Analysis of Public Policy: Method, Process and Product	**VAN BOGARD DUNN, PH.D.** Commission on Interprofessional Education and Practice The Ohio State University Columbus, OH
9:40	Surveying Research Interests of Allied Health Professionals	**M. ROSITA SCHILLER, PH.D., R.D.** School of Allied Medical Professions The Ohio State University Columbus, OH
10:00	Break	
10:20	Interprofessional Education and Attitude Change: Research Design and the Collaborative Process	**R. MICHAEL CASTO, PH.D.** Commission on Interprofessional Education and Practice The Ohio State University Columbus, OH
10:40	Professional Team Building as a Curricular Experience for Undergraduates in Allied Health	**L. GEORGE VAN SON, ED.D.** School of Allied Health Professions Ithaca College Ithaca, NY

11:00	Role-Modeling Health Promotion and Disease Prevention for Medical Laboratory Personnel: A Pilot Program	**JAMES P. CORNISH, PH.D., MT(ASCP)** School of Allied Health The University of Connecticut Storrs, CT
11:20	Continuing Education Needs of Allied Health Department Heads	**MARJORIE BRUNNER, M.S., MT(ASCP)** School of Allied Medical Professions The Ohio State Univerity Columbus, OH
11:45	Lunch, Rhodes Hall Conference Dining Room	
12:15	Awards Presentation	John R. Snyder, Ph.D.
12:30	Keynote Address Consortia and Collaborative Research: Getting Started	**BARBARA C. HANSEN, PH.D.** Associate Vice President for Research Dean, Graduate School Southern Illinois University Carbondale, IL
	Moderator	Philip D. Beckley, M.S.
1:10	Home Peak Flow Monitoring in the Asthmatic Child	**LINDA F. SAMSON, M.N., R.N.C.** School of Nursing University of Pennsylvania Philadelphia, PA
1:30	Collaborative Research on the Treatment and Prevention of Hemolytic Disease of the Newborn	**ABDUL WAHEED, M.S., MT(ASCP)SBB** Transfusion Service Ohio State University Hospitals Columbus, OH
1:50	Prospective Study of Number Eight French Enteral Feeding Tubes in the Clinical Setting	**DIANE M. SNYDER, M.S., R.D.** Clinical Nutrition St. Elizabeth Hospital Medical Center Youngstown, OH
2:10	Serological Studies on the Red Cells of a Gorilla Family	**LAURIE J. UNSICKER, M.T.** Clinical Laboratory Ohio State University Hospitals Columbus, OH
2:30	Break	
2:50	The Living Laboratory: An Allied Health Collaboration with Architecture and Engineering	**HARRY A. SULTZ, DDS, M.P.H.** School of Health Related Professions State University of New York Buffalo, NY
3:10	A Model for Rural Elderly Health Needs Assessment: Methodology and Results	**VIRGINIA R. ALLEN, ED.D., OTR** Medical College of Georgia Augusta, GA

3:30	Cost Containment Strategies for the Laboratory and Their Effect on Sample Volume	**CRAIG LEHMANN, M.S., CC(NRCC)** School of Allied Health Professions State University of New York Stony Brook, NY
3:50	Responding to the Challenges of Tomorrow: Changes in the Dissemination of Clinical Information	**FRANCINE SEVEL, PH.D.** School of Allied Medical Professions The Ohio State University Columbus, OH
4:10	Wine and Cheese	
4:30	Discussion: Planning an Allied Health Research Consortium	
5:00	Adjournment	

POSTER SESSIONS

Evaluation of Pre-treatment Fixation On the Indirect Avidin-Biotin Immunofluorescence Test for Platelet Antibodies	Daniel Jaskowiak, B.S., MT(ASCP)SBB Transfusion Service Ohio State University Hospitals Columbus, OH
Evaluation of an Indirect Aviden-Biotin Complex Immunofluorscent Assay For Platelet Antibodies	Melanie S. Kennedy, M.D. The Ohio State University Columbus, OH
Critical Factors Associated with Substance Abuse and Chemical Dependency among Nurse Anesthetists	Jack Norris, M.S., CRNA School of Allied Medical Professions The Ohio State University Columbus, OH
Occupational Therapy Intervention With Down's Syndrone Children: A Pilot Study	Nancy D. Prendergast, Ed.D., OTR School of Allied Health Sciences Medical College of Georgia Augusta, GA
Platelet Utilization Review: A Rational Approach	Abdul Waheed, M.S., MT(ASCP)SBB Transfusion Service Ohio State University Hospitals Columbus, OH
Analysis of the Effects of Inhaled Diesel Exhaust on the Alveolar Intravascular and Interstitial Cellular Components of Rodent Lungs	M. Ann Wallace, M.S., MT(ASCP)SBB College of Pharmacy & Allied Health Professions Wayne State University Detroit, MI
Graft Versus Host Disease and Lymphocytotoxic Antibodies in Bone Marrow Transplant Patients	Marjorie A. Williams, B.S. Transfusion Service Ohio State University Hospitals Columbus, OH

SYMPOSIUM PLANNING COMMITTEE

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Philip D. Beckley, M.S., CPT, CCT
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H. Kay Grant, Ph.D., OTR
Merida L. Johns, M.P.S., RRA
M. Rosita Schiller, Ph.D., RD

School of Allied Medical Professions
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Columbus, OH

RESEARCH AWARDS

Awards were presented by Dr. John Snyder to:

WILFRID DOIRON, PH.D. - "Health Promotion and Disease Prevention in Allied Health: An Interdisciplinary and Interinstitutional Approach to Research and Change"

HARRY A. SULTZ, DDS, MPH - "The Living Laboratory: An Allied Health Collaboration with Architecture and Engineering"

L. GEORGE VAN SON, ED.D. - "Professional Team Building as a Curricular Experience for Undergraduates in Allied Health"

Three abstracts were selected to receive research awards. Recognition plaques were given to the above named presenters prior to the Keynote Address. Award decisions were based on the following criteria:

1. The abstract clearly demonstrated a research effort which was interdisciplinary and/or interinstitutional in nature.
2. The presentation associated with this abstract would be of interest to an interdisciplinary allied health audience.
3. The abstract stated the purpose of the study, methodology employed, main findings and principle conclusions.
4. The abstract was clearly written, organized and concise.
5. The presentation associated with this abstract would encourage and stimulate research on both a faculty and graduate student level.

THE KEYNOTE ADDRESS

A highlight of the day was the keynote speaker, Dr. Barbara C. Hansen, Associate Vice-President for Research and Dean of the Graduate School at Southern Illinois University.* Dr. Hansen described the genesis and operation of a collaborative research team. An article describing this consortium is reprinted here at the suggestion of Dr. Hansen and with permission of the American Journal of Nursing Company.

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*Dr. Hansen was recently named Vice President for Research and Graduate Studies at the University of Maryland.

Collaborative Nursing Research: Anatomy of a Successful Consortium

NANCY BERGSTROM • BARBARA C. HANSEN • MARCIA GRANT
ROBERT HANSON • WINIFRED KUBO • GERALDINE PADILLA • HILDA LUNA WONG

The purpose of this paper is to describe the collaborative efforts of one successful research group. The Tube Feed Consortium Group was composed of seven investigators who lived in four different geographic locations. One of the members served as principal investigator and chairman of the group; the others as coinvestigators. A coinvestigator served as principal investigator in each location, managing subcontracted budgets and scientific concerns. This structure promoted efficiency in budget management, conflict management, and division of labor. Major advantages to this approach to the conduct of research included (a) a large number of subjects studied in a relatively short time period; (b) a data collection structure, which permitted wider generalization than data collected in one institution by one investigator; (c) a mechanism for direct replication and replication with expansion; (d) maximum usage and distribution of resources between investigators. Mechanisms established early in the history of the group helped to achieve maximum communication, resolve potential conflicts, ensure reliability of data, ensure publication and presentation rights of collaborators, and manage the overall budget and subcontracts. The group remained intact for eight years, completed all the proposed studies plus other related studies, presented numerous papers, and continues to publish findings of these endeavors.

The purpose of this paper is to describe the collaborative efforts of one successful research group by presenting descriptions of (a) the research project; (b) the group structure and decision-making process; (c) the advantages and obstacles encountered during the collaborative period; and (d) the outcomes of the consortium effort.

The Research Project

The Tube Feeding Consortium, a group of seven coinvestigators, was initially formed as a result of a grant from the Division of Nursing entitled "Regional Program for Nursing Research and Development." Awarded to the Western Council for Higher Education in Nursing (WCHEN), the grant enabled WCHEN to sponsor workshops where nurses from a variety of clinical backgrounds and levels of research expertise assembled to explore common research interests and to form collaborative research groups. The newly formed groups were subsequently invited to attend grantsmanship workshops and were served by a WCHEN staff consultant at several meetings of the collaborative group. This overall process has been previously described in detail (Krueger, Nelson, & Wolanin, 1978).

The Tube Feeding Group was formed as a result of one of the initial WCHEN-sponsored workshops. Of its seven members, two had previous-

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BARBARA HANSEN, PHD, RN, is the associate vice-president for research and dean of the graduate school, Southern Illinois University, Carbondale, IL.

MARCIA GRANT, MSN, RN, is a research associate, clinical nursing research, city of Hope National Medical Center, Duarte, CA, and a doctoral student in nursing at the University of California at San Francisco.

ROBERT HANSON, MN, RN, is owner of Health Systems Management Services, Seattle, WA.

WINIFRED KUBO, MSN, RN, resides in Honolulu, HI.

GERALDINE PADILLA, PHD, is director of clinical nursing research at the city of Hope National Medical Center, Duarte, CA.

HILDA LUNA WONG, MA, RN, is a homemaker residing in Sonoma, CA.

Accepted for publication February 11, 1983.

Supported in part by USPHS Division of Nursing grant #NU00523 (later changed to NU00650), Ross Laboratories, the Western Interstate Council on Higher Education in Nursing and its Division of Nursing grant #NU00415, and the Northwest Medical Research Foundation. This consortium was developed under the initial sponsorship of WCHEN, and was subsequently supported by the Division of Nursing grant entitled "Nursing Interventions in Problems of Tube Feeding," Barbara C. (Walike) Hansen, PhD, RN, principal investigator, coinvestigators Nancy Bergstrom, PhD, RN, Marcia Grant, MSN, RN, Robert Hanson, MN, RN, Winifred Kubo, MSN, RN, Geraldine Padilla, PhD, and Hilda Luna Wong, MA, RN. In addition to the original investigators, the consortium was joined for varying periods by the following investigators whose efforts contributed greatly to the success of the projects: Margaret Heitkempter, PhD, RN, Deborah Martin, MN, RN, Phyllis Tanabe, MS, RN, Verlene Vanderburg, BS, RN, Patricia Saran, BS, RN, Mary McHugh, MS, RN, Bertha Rains, MS, RN, and Betsy Ono, MS, RN.

ly studied aspects of patient problems related to tube feeding and were interested in continuing this research. Four were interested in patient preparation for stressful procedures, problems of fluid and electrolyte balance, and rehabilitation of patients. These areas of general interest could all be channeled to focus on the problems of patients receiving tube feedings; hence, early consensus regarding the study area was achieved. The seventh member was from one of the five institutions represented already, and joined the group effort within one week of that initial meeting.

The specific problems under consideration were identified after conducting a preliminary descriptive study of 121 patients who received tube feedings from 4 to 30 days (Walike, Walike, Hanson, Grant, Kubo, Bergstrom, Wong, Padilla, & Williams, 1975). On the basis of problems documented in this study and discrepancies that were identified between clinical practice and textbook practice recommendations, a series was planned to study these patient problems and methodological issues. The overall objective of the subsequent proposal, "Nursing Interventions in Problems of Tube Feeding," was to improve the comfort, safety, and success of tube feeding.

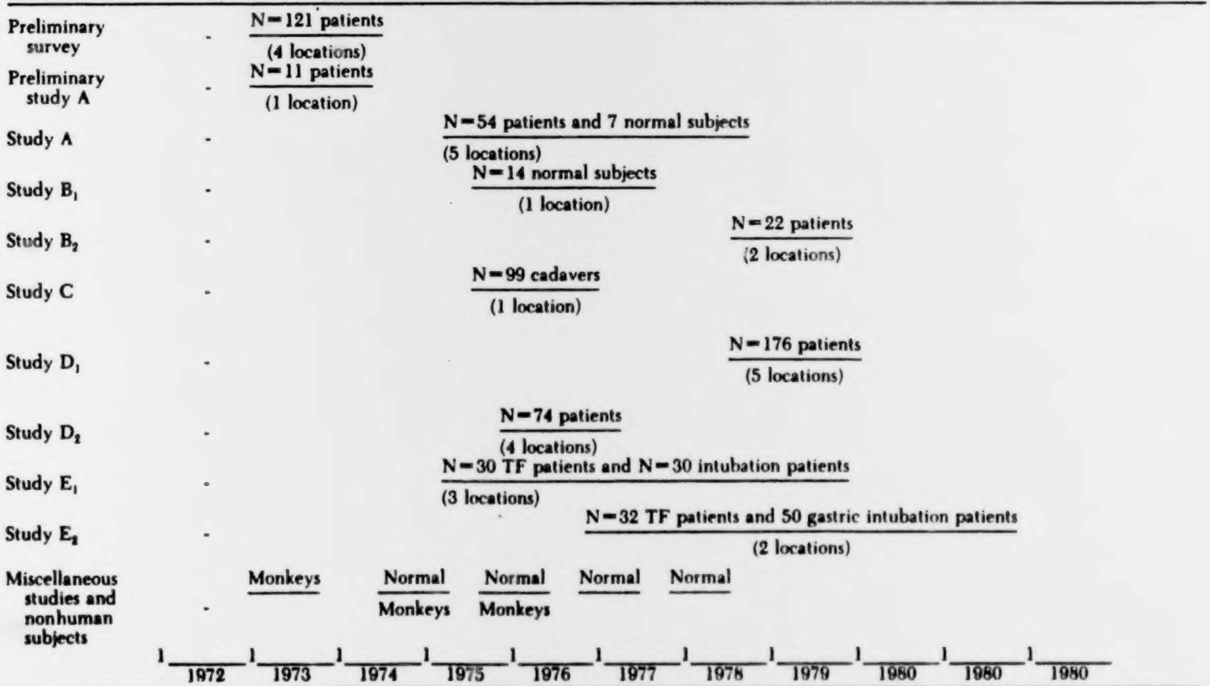
The structure and features of this collaborative process led Krueger et al. (1978) to describe the project as "horizontal building" research. A single theoretical area was studied by individuals investigating complementary pieces of the theoretical area. "Vertical building" also occurred in some areas where the same question or modifications of the question were asked in two or more subsequent studies.

Each of the descriptive and experimental studies employed different research designs and strategies; however, many of the variables were similar. The similarity between these variables was used to elicit the greatest amount of information that would be derived about tube-fed patients in general, from any one study. Since more than 200 variables were identified as salient to one or more of the studies, multiple instruments, rather than one large instrument, were developed by grouping variables according to the frequency with which they would be observed or according to the needs of a specific research protocol. This matrix of instruments was part of the efficiency that resulted from the simultaneous and parallel approach to a number of different questions related to a single nursing-care problem area.

The battery of instruments developed permitted investigators to select those that were most appropriate for a given study and allowed data collection from one subject for more than one study. For example, the teaching films used as an intervention to reduce distress related to enteral feedings did not influence the outcome of the study of hydration where descriptive data related to hydration status were collected over a period of days when feedings remained consistent. Hence, the addition of two instruments, Mood Adjective Check List (MACL) and Tube Feeding and Hospital Experiences Check List (TFHECL), permitted simultaneous data collection on one patient for two studies. This strategy proved very cost-effective, and was successful in increasing the available subject pool. Investigators in one location collected data for those in other locations to enhance the number of subjects when possible (Table 1).

In addition to the central projects, 14 additional related studies were conducted by individual members of the consortium, by a subgroup of members, or by undergraduate or graduate nursing students associated with one of the members. All grew out of and were encouraged by the consortium effort.

Table 1. Sequence of Consortium Studies



Group Structure and Decision-Making Process

The structure and decision-making processes of the group were established early and showed little fluctuation. The structure emerged rather naturally for two reasons. First, WCHEN provided some typing, duplicating, and mailing services to groups. In order to take advantage of these services, it was necessary to have one contact person to serve as a liaison. This person had the responsibility of collecting materials generated by the group and relaying them to the main office in a cohesive, logical manner.

The second factor in early group structure emerged from the composition of the group. Two group members had doctoral preparation and research expertise, but five members were master's-prepared, had conducted little previous research, and had not previously obtained funding. Therefore, it was decided that the doctorally prepared nurse with previous research-grant experience and with experience in a previous study of tube-fed patients would be the contact person with WCHEN and the natural principal investigator when funding was sought. As the interests and investments of individuals in substudies solidified, each person became identified as the principal or coprincipal investigator of a specific study. Thus, one individual was the principal investigator with coinvestigators.

This structure was useful because it promoted efficiency in decision making regarding budget management, conflict management, and division of labor. In any group venture conflicts of interest can end in stalemate unless mechanisms have been established for identifying ultimate authority for decision making. In this consortium group one individual, the primary principal investigator, was accepted in this role. The group encountered few situations where it could not easily achieve consensus. In these rare instances, however, the group accepted the principal investigator's final decisions through arbitration. It was important that this structure was defined and accepted by all of the group members from the very onset of the project. That the group remained intact, without attrition, for eight years testifies to the success of this method. The only member who eventually chose to withdraw did so for personal reasons.

The division of labor and distribution of work load was fluid and constantly changing as the consortium effort progressed, and it was important that specific responsibilities be defined and assigned. These responsibilities ranged from major tasks such as final preparation of the grant proposal to seemingly small, but important tasks such as control over the assignment of subject study numbers. Major responsibilities in the many collaborative efforts were budget management, data forms format and coding, data keypunching, editing, and computer analysis.

The primary responsibility for the budget was retained by the principal investigator. The total grant dollars were received by the institution where the principal investigator was employed. Coinvestigators in other locations generated budgets and were awarded subcontracts each fiscal year. This method of budgetary management required a great deal more coordination than the usual situation where the principal investigator plans and manages a single budget. Subcontracting worked well and allowed persons in each setting to plan and coordinate research activities without the delays that could be anticipated if coinvestigators attempted to bill the principal investigator's institution for incurred expenses.

Since data were collected in a variety of settings and cities, management of data could have been a difficult task. Initially, one member coordinated the development of data tools that would readily lend themselves to direct keypunching. A manual was developed to facilitate the use of the instruments and to standardize coding. Methods for assuring consistent and continuous reliability in the use of the instruments were also developed. Despite this attention to details of data collection and coding, it was essential that one person assume responsibility for coding, keypunching, and verification of all data. The triplicate NCR paper used for all data collection tools was important since copies of data could be retained by the data collecting site and mailed to the principal investigator and to the person responsible for coding and entering data on the computer. Ultimate responsibility for the data analysis rested with the principal investigator of each specific study, although all investigators participated in various portions.

Advantages and Obstacles

Several advantages of the consortium approach were immediately apparent. First, a larger number of subjects were studied over a shorter period of time. More subjects were available since personnel in more than one setting were constantly searching for subjects who would meet criteria for inclusion in one or more of the studies that were ongoing in that setting. Second, this large number of subjects could be further divided into smaller groups with specific characteristics, such as diagnosis, ethnicity, or geographic region. For instance, of the 61 patients who participated in one study, 33 had a diagnosis of cancer of the head/or neck and 21 had neurological disturbances. An analysis of the data of these two groups showed that there were no differences between the groups in relation to the major findings of the study. Both head and neck cancer patients and neurologically impaired patients had an increase in stool number when lactose was an element of the tube-feeding diet. This phenomenon, which permitted generalization of findngs to two groups of patients, is one example of horizontal building as defined by Krueger et al. (1978).

Third, replication of findings, both by direct replication and through expansion or extension of a previous study, was a key feature of this consortium approach. A type of replication exists when investigators in several settings use the same research protocol and obtain the same results. By dividing the total number of subjects into groups based on the setting or investigator responsible for obtaining the data, the data can be examined to determine if the same findings exist among all subgroups. For instance, in one investigation normal subjects were studied to determine their response to three sizes of tube-feeding meals (200, 350, and 500 ml). It was concluded that subjects tolerated all three volumes well when feedings were administered slowly (<30 ml/min) (Heitkemper, Martin, Hansen, & Hanson, 1981). In another study the effect of small versus larger, less frequent feedings on the comfort and gastrointestinal responses of the patients was explored. The same total volume of feeding was administered in both instances; however, the total was divided into three or six equal feedings. Normal subjects in the first study, like patient subjects in the second, tolerated the larger volume feedings. They also tolerated the larger, less frequently administered feedings better than the small, frequent feedings.

The advantage of built-in replication draws attention to another major advantage. Research-based knowledge, based upon multiple studies, can be used to update current nursing practice. The project to study the Conduct and Utilization of Research in Nursing (CURN) has focused extensively on the utilization of research in nursing practice. The first criterion identified by this group for implementation of research findings in nursing practice was replication (Haller, Reynolds, & Horsley, 1979). The consortium approach can expand the knowledge basis on which the science of nursing rests. Nursing knowledge is advanced when it is built upon clinical studies addressing various aspects with a single focal point. The type of replication described in this paper can meet this criterion.

Last, the advantage of multiple resources available to members of a consortium group is of primary importance. The individual expertise of the investigators and the resources that became available were considerable. The computing services and statistical consultation available were greater in some settings than in others. The available support staff, the skills of investigators in preparing proposals and writing for publication, and the available time to supervise daily or to participate in data collection varied between investigators. Sharing these skills and resources tended to promote more efficient and cost-effective research.

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The collaborative approach has many advantages. A number of problems can arise, however. Communication between the seven investigators who lived in five different locations while involved in the seven studies could have been a major problem. The factors that facilitated communication were frequent meetings of all investigators (at least three to four meetings per year), telephone calls, conference calls, correspondence, and occasional individual visits to coordinate specific research development. Successful communication and coordination were expensive. The frequent meetings between all of the investigators and selected staff members were indispensable in the process of the collection and interpretation of data. Initially, the meetings themselves provided an incentive to some members, but as these accumulated and professional responsibilities increased, it became more difficult to schedule meetings.

The location of meetings was rotated between investigator locations, distributing travel requirements and giving investigators an opportunity to see all the research sites in person.

Frequent telephone calls were a valuable source of communication. While these calls were essential, they were also a significant budget item. Several methods of alternative communication were explored. Letter writing did not always provide a satisfactory means of communication because of mail delays, the time involved in writing the letter, and the reduced level of interaction in such unilateral communication. Similarly, teleconferencing was initially considered but was not used because not all members had convenient access to terminals and telephone communication systems. Nevertheless, effective communication was established and maintained because each investigator took responsibility for sharing information with the group. The major difficulty was deciding how to use the financial resources to assure effectiveness of the communication process. The interinstitutional approach proved cost-effective despite the expenses incurred for communication. This communication not only assured completion of all proposed studies but also the continued enhancement of the professional commitment of each individual.

The second major difficulty in conducting interinstitutional research was assurance of the reliability of the data collected. The visits and telephone calls provided an effective means of discussing problems and providing training. These methods were enhanced by detailed day-to-day protocols. The amount of detail involved in the protocol facilitated standardization of data collection procedures between institutions.

Face-to-face communication was necessary in some instances to standardize data collection procedures. When one study was initiated, for instance, one of the staff from Los Angeles visited the staff in Ann Arbor and provided a data collection training program that included videotape demonstrations and return demonstrations using patients in Ann Arbor for actual practice. This method increased interrater reliability.

A third difficulty encountered in the use of multiple agencies was the process of obtaining the approval of multiple internal review boards each with differing agency requirements. In most instances, agencies used different formats for gaining access to patients and for obtaining ethical approval. While no one of these agencies provided a major stumbling block to an investigator, negotiations with at least 14 agencies for use of subjects in one to three studies each was time consuming. These negotiations clearly became easier as the investigators became known in a given setting. Most of the coinvestigators carried out the negotiations in their respective agencies, but on a few occasions one investigator assisted in writing the application for ethical review for another less-experienced investigator. In one instance when an agency expressed a great deal of hesitation about participating in nursing research, the principal investigator facilitated the process by visiting the institution with the coinvestigator.

A fourth difficulty, and perhaps the one that plagues most collaborative efforts, was territoriality. The problem was minimal in this consortium group. From the outset the group assumed the attitude that they would agree and share. While a number of overall study areas were originally suggested, the group quickly settled on one area. Rather than forcing the members to agree on one study, each person was encouraged to identify an area within that topic area that could be pursued. It was understood that no person would be expected to have sole responsibility and sole credit for any one study.

Publication and other forms of recognition that would emerge from the group were discussed on the first day the group convened, and a plan was agreed upon to prevent future difficulties. At each meeting publications, including titles, interested authors, and potential publication sources, were discussed. The resulting list was updated and revised at each subsequent meeting. Dissemination of findings was always considered a high priority of the group. The publication policy has been that the first and second authors are those who give the greatest amount of effort to manuscript preparation. Multiple names on a manuscript recognize that, while one person may have given more effort to manuscript preparation, other investigators devoted significant effort to the areas of planning the study, gaining access to subjects, and facilitating and carrying out data collection and coordinating data analysis. The investigator of the specific study was given a time limit of two years to complete a manuscript. Lack of productivity after two years meant that someone else in the group could take first-author responsibility for the manuscript.

A fifth potential problem area was budget. Budgetary problems did not emerge due to the structure of our group, as the principal investigator managed the budget. At each meeting investigators from other locations projected budgetary needs on a yearly basis (more frequently, when necessary). The principal investigator's institution awarded subcontracts to the institutions of the coinvestigators. Budgets were reviewed at each meeting to determine if re-allocations were necessary. In some instances, busy schedules prevented an investigator from collecting data, and excess funds could be channeled to other investigators who were able to obtain more subjects. Major control for the overall budget remained with the principal investigator and major control for the subcontract was delegated to the coinvestigator in the agency.

Unequal resources, a sixth potential difficulty, became less acute as the project progressed. Personnel were hired to keep pace with the number of subjects available for participation in studies. There were discrepancies between the cost/patient of data collection in each institution. These differences were due in part to travel distances and times, mileage expenses, efficiency of personnel, and other factors. It was always assumed that these differences were justified and group relations were facilitated by placing key emphasis on the data that was collected.

One last disadvantage of collaborative efforts was the lapse of time between various events. The preliminary study was conducted steadily over the first year and the proposal was prepared. During this period of active group participation, motivation was high. Once the proposal was submitted, motivation waned as a period elapsed until funding arrived. Those coinvestigators who were neophytes found this period most difficult. The more experienced investigators were involved in other projects and devoted more time to those endeavors. Group cohesiveness was facilitated by occasional telephone conversations and correspondence.

In summary, factors that tend to facilitate the collaborative process include: (a) strong leadership, (b) willingness to share, (c) good communication, (d) an attitude of give and take, (e) built-in rewards, and (f) supportive institutional leaders. None of these variables remain static and all require continual efforts on the part of the collaborators to produce a positive climate.

Results

Personally and professionally, each member would testify to the positive effects of the group effort. During the term of the group two coinvestigators and one research associate entered doctoral study. Five master's theses and three doctoral dissertations have thus strengthened the overall effort. Numerous presentations have been given at national meetings of nurses, and for combined nurse, physician, nutritionist, physiologist, and/or psychologist audiences. And now, eight years after its initial meeting, this group is one made up of seasoned nursing researchers. **NR**

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PART I

RESEARCH RELATED TO GLOBAL ISSUES IN ALLIED HEALTH

The Symposium opened with four presentations dealing with research on issues of a general nature:

Incentives for Coordinating Care

Collaborative Approach to Research and Change

Analysis of Public Policy

Research Interests of Health Professionals

COORDINATION OF THE HEALTH CARE SYSTEM IN THE STATE OF MICHIGAN

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ABSTRACT

Behind the problem of cost management in the health care system is the question of coordination. Unlike other large scale systems, the health care system lacks consensus on how to coordinate itself. It roams among community planning, competition, cooperation and regulation as coordination methods. Consensus on one, or more likely a mix, of these methods requires an understanding of the incentives to use any method.

This research used a key informant survey method to identify perceived incentives to use the four methods of coordination listed above and the constraints and contingencies to their use. Two waves of data collection were used. The first was in-depth interviews with key decision makers -- health facility chief executives, corporate health benefit managers, key legislators and state policy leaders -- followed by a mailed survey to hundreds of key decision makers throughout the state.

The findings make use of the survey data -- 335 persons responding to 216 items of data each -- and content analysis from the interviews to provide insight into the operation and coordination of the health care system. Implications for allied health education and practice are discussed.

This is a collaborative research between a dean of an allied health type college and executive officers of a state health department. It provides an excellent example of how an allied health school can collaborate with public policy makers for the good of the health care system.

OVERVIEW AND SUMMARY OF FINDINGS

Cost management is now widely perceived as the central problem in our health care system. Behind that problem is the question of coordination. How should or can the health care system be coordinated by community planning, competition, cooperation, regulation or a synergistic combination of these? This question has roamed the system for decades. Currently, the emphasis is on competition. But, there is not a consensus on the efficacy of that as the central coordination mechanism.

All reasonably effective large scale systems do have a consensus on methods of coordination. It is a natural evolutionary phenomenon arising in mature living systems. The commercial and industrial system has high levels of consensus on the use of competition as the central coordination mechanism. Government bodies have consensus on the use of regulation, community planning and cooperation. In the health care system there is not a consensus.

This condition is a barrier to effective operation of the system. It increases the probability of unpredictable and undisciplined behavior of the market. This lack of consensus and of understanding of the incentives to reaching a consensus is a major barrier to effective cost management, as well as assuring access and quality services to all in need.

This research identifies the incentives, as perceived by key decision makers in the Michigan health care system, to use one or another of the methods of coordination or combinations thereof. The key decision makers are identified as the major purchasers of service (employers and government), providers of service and regulators. A basic premise of the study is that the thinking of key decision makers shapes any large system. Thus the focus of the data collection was on those key decision makers i.e., employer health benefits managers, chief executives of hospitals, home health and HMO's professional leaders in medicine and nursing, public purchasers of service, health systems agencies, state level public executives and key state legislators as well as selected other key opinion leaders.

Initial data collection was through intensive interviews with a sample of forty-five individuals throughout the state. This aided in the development of a survey instrument which was distributed among all of the key decision makers. Three hundred and forty of these people contributed their thinking by each providing approximately two hundred items of data on incentives to coordinate by the four methods as well as on what they experience as the intervening factors to effective use of the coordination mechanisms.

The data do confirm the original premise of the study. There is not much consensus on a single method of coordination. It appears that key decision makers perceive the four methods of coordination as serving different incentives. The incentives of revenue, market share and domain expansion are most closely tied to competition. Incentives like quality, patient access, and meeting community needs are more tied to the use of community planning, cooperation and regulation.

Both the interviews and the survey data lead us to the conclusion that cooperation and competition go hand in hand. Respondents report that both are more extensively in use than in the past. Currently, cooperation tends to be tied to more specific mutual benefits than in the past and tends to be used in the service of competition rather than community planning as may have been the case twenty years ago.

Community planning is not viewed as a strong coordinative mechanism. Again, both the interview and survey data lead to this conclusion. While it is considered a high ideal, it is not viewed as practical in application. It is clear that respondents are not ready to give up on community planning. At the same time, they do not see as positive a future for this method of coordination as they do for the others.

Though regulation is not considered the preferred method for the pursuit of any incentive, key decision makers are more clear about regulation and its functions than they are about any of the other methods of coordination. In a factor analysis of all of the incentives and coordination methods, it stands out as a unitary idea in the responses of the key decision makers.

Practice/safety standards and assuring access to patients are reported as the strongest ideal and actual impacts of regulation. This finding is consistent with the view of the respondents on which incentives are best pursued through regulation as the coordination method. Quality and patient access stand out as the incentives best served by regulation.

There are many significant differences between sub-groups of decision makers. Responses suggest that the hospitals and home health agencies differ in a number of ways as to how they view coordination of the system. In general, home health agency executives are, as might be expected, more community planning oriented than their counterparts in hospitals.

Providers and employers (buyers) have significant differences in their perceptions of the system. This is particularly pronounced in an analysis of cost containment methods that buyers report they are using and the perception of the providers as to how the buyers are using these same methods. In general, the providers think the buyers are doing much more than they report doing.

Men and women differ in many significant ways as to how they view incentives to consensus on coordination as well as how they view the operation of the system. Our statistical analysis clearly suggests that these are real differences. A major contributor to the difference is the fact that the great majority of the women respondents are executives of home health agencies. In part, the differences may be of industry rather than gender.

In general, women view quality, patient access and meeting community needs as stronger incentives than do men. Women report incentives to use cooperation, community planning and regulation as stronger, in most cases, than do men. Men and women are much more similar when it comes to the strength of incentives to use competition as the method of coordination.

The survey also produced data on what the key decision makers view as the forces currently "driving" the health care system. The data tell us that they view medicare, medicaid and blue cross/blue shield as the strongest forces. These are followed by physician practice style. It may not be pleasing but may be of interest to allied health professionals to know that of the twenty-one forces the respondents were asked to rate, other health professionals (i.e., allied health) were viewed as the least powerful driving force.

The findings will be useful to public and private policy makers, key decision makers and professional associations that wish to be able to influence the evolution of the health care system. Insights into perceived incentives and their constraints and contingencies will assist such people to tailor action to increase the probability of desired outcomes.

This presentation provides early and incomplete findings. Copies of the complete findings and study design can be obtained after December 31, 1985, from Dr. William Burian, Dean, College of Health and Human Services, Western Michigan University, Kalamazoo, Michigan 49008, or Dr. Harvey Day, Chief, Bureau of Health Facilities, Michigan Department of Public Health, 3500 North Logan, Lansing, Michigan 49909.

Dr. William Burian is Dean, College of Health and Human Services, Western Michigan University. Ms. Kathryn Boyden is a graduate student in Occupational Therapy at the same university. Dr. Patricia Hebert is Evaluation Specialist, Michigan Department of Public Health. This research was made possible by the Professional Development Program of Western Michigan University which allowed Dr. Burian almost three months of fully supported leave. The project was supported by the Bureau of Health Facilities, Michigan Department of Public Health. The Bureau provided financial support for research costs, staff assistance and support for access to key decision makers.

HEALTH PROMOTION AND DISEASE PREVENTION IN ALLIED HEALTH: AN INTERDISCIPLINARY AND INTERINSTITUTIONAL APPROACH TO RESEARCH AND CHANGE

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ABSTRACT

Beginning October, 1983 an interdisciplinary team embarked upon a three year, federally-supported project designed to evaluate the level of faculty, student and practicing professional knowledge of Health Promotion and Disease Prevention; to develop learning opportunities designed to improve identified deficits of knowledge or skills; and to provide consultative services and continuing education opportunities for other educational and service delivery institutions and their personnel in this critical area. High Blood Pressure, Nutrition and Health, Control of Stress and Violent Behavior, Physical Fitness, and Health and Smoking were the priority areas chosen for emphasis. Data were collected to determine the amount and level of depth of coverage of these topics in the undergraduate and graduate courses of all components (Allied Health, Clinical Dietetics, Health Science, Medical Laboratory Sciences and Physical Therapy) within the School. Questionnaires were also developed to evaluate the emphasis placed upon these topics in the clinical facilities associated with the various professional programs, and to ascertain the perceived interest within this group in them. Health Risk Assessment Data were also obtained on faculty and a selected sample of undergraduate students. Results of these studies are reviewed as are approaches to utilize a diversity of professionals in the development and implementation of educational interventions for Health Promotion and Disease Prevention.

INTRODUCTION

Beginning October, 1983 an interdisciplinary team at the University of Connecticut School of Allied Health Professions embarked upon a three-year, federally supported project designed to evaluate the level of faculty, student and practicing professional knowledge of Health Promotion and Disease Prevention; to develop learning opportunities for these people designed to improve identified deficits of knowledge or skills; and to provide consultative services and continuing education opportunities for other educational and service delivery institutions and their personnel in this critical area. Federal government publications, "Health Promotion and Disease Prevention: Objectives for the Nation" and "Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention" provided the initial guidelines for the development of this project and, on the basis of the academic and professional strengths and interests of the Team and the School and because of their interrelatedness, it was decided that the project would focus on five of the fifteen priority areas described therein. These are High Blood Pressure, Nutrition and Health, Control of Stress, Physical Fitness, and Health and Smoking. The core membership of the Project Team consisted of a biologist, a registered dietitian/higher education administrative specialist, a professional community health educator and a registered dietitian/exercise specialist. In addition, each of these people had varying amounts of experience in public health program design and delivery, higher education and continuing education curriculum designs and delivery, basic and applied science research and management/administration. The core team members, depending upon the priority are being studied, were assisted by faculty with additional expertise in clinical dietetics/nutrition, exercise and exercise physiology, psychology, questionnaire design and data analysis, Physical Therapy and Medical Laboratory Sciences.

While the primary goals and objectives of this project are oriented toward improving the knowledge base of allied health faculty, students and practicing professionals in the subject areas mentioned above and shifting, when appropriate, the focus of practice more toward health promotion and disease prevention, it was essential to determine current status prior to developing learning opportunities for the populations. To this end, data was collected in various ways to establish a baseline with respect to the curricula in the School (Clinical Dietetics, Medical Laboratory Sciences, Physical Therapy, Graduate Program, Allied Health and Health Sciences); the health status of faculty and students within the School; the same data for a comparable group of faculty in another School at the University; and, the levels of current activity in knowledge of and interest in Health Promotion and Disease Prevention at the clinical affiliation sites used by the undergraduate programs. Each of these activities will be described in turn.

CURRICULUM REVIEW

In order to maximize the number of responses and to guarantee as much as possible the completeness of the data collected, it was decided to develop an interview format/data collection instrument for this review. A copy of this format is found in Apendix A. In addition to focusing upon the five priority areas of the project, the instrument also requests information regarding wellness and disease prevention generally, as well as data regarding skills of value to professionals contemplating involvement with health promotion or disease prevention in their practices. The latter data has not yet been analyzed. Data collection was accomplished by personal interviews with the faculty member or members responsible for teaching each course. Ms. Janet DePaola, R.D., Associate Project Coordinator, and Mrs. Susan Gibbons, R.P.T., a graduate assistant, carried out the interviews and summarized the data. Table I provides an overview of the results obtained and Table II a more precise delineation of the hours devoted to each topic by each curriculum. With the exception of the Clinical Dietetics program, which already focuses heavily on the nutrition priority area, the amount of time devoted to Health Promotion and Disease Prevention ranged from a low of 5% to a high of 16% for the Physical Therapy program. In the latter case, however, almost 50% of the focus was upon Physical Fitness and Exercise which is an area in which one would expect emphasis for this group. Discounting the fitness focus of Physical Therapy and the nutrition focus of Dietetics, it is clear that the current emphasis of the currricula are not heavily upon Health Promotion and Disease Prevention. These results were not at all surprising to us by they are useful to emphasize to the faculty and amdministration specifically what areas need to be addressed in the development of more prevention/promotion-oriented curricula within the School.

TABLE I
HP/DP CURRICULUM REVIEW: OVERVIEW

- 34 courses reviewed
  - 14 Allied Health
  - 9 Physical Therapy
  - 7 Clinical Dietetics
  - 1 Medical laboratory Sciences
  - 3 Health Science

- 27 have some HP/DP
- 11 would like to add more to their present content
- 19 have some disease prevention
- 17 nutrition

- 13 wellness
- 11 exercise
- 11 high blood pressure
- 9 smoking
- 8 stress

Allied Health:	11 courses out of 14 have some HP/DP 8 courses have some content on disease prevention 5 wellness; 5 nutrition; 3 other
Physical Therapy:	8 courses out of 9 have some HP/DP 6 disease prevention; 6 exercise; 4 nutrition; 3 other
Clinical Dietetics:	7 courses out of 7 have some HP/DP 7 nutrition; 4 wellness; 4 disease prevention 4 high blood pressure; 1 smoking; 1 exercise; 1 stress
Medical Laboratory Science:	1 course reviewed 1 smoking cessation
Health Science:	1 course out of 3 have some HP/DP all areas covered

TABLE II
NUMBER OF HOURS, % OF CURRICULUM BEING SPENT ON HP/DP

	ALLIED HEALTH (N=14)		PHYSICAL THERAPY (N=9)		CLINICAL DIETETICS (N=7)		MED. LAB. SCIENCE (N=1)		HEALTH SCIENCE (N=3)	
	Hours	% Hrs. in Curr: HP/DP	Hours	% Hrs. in Curr: HP/DP	Hours	% Hrs. in Curr: HP/DP	Hours	% Hrs. in Curr: HP/DP	Hours..	% Hrs. in Curr: HP/DB
Total Hours of Courses Reviewed	434		343		306		21		126	
Total Hours HP/DB	39	9%	55	16%	213	70%	1	5%	6	5%
Wellness	12	3%	3	1.0%	15	5%	0	0	1	.8%
Disease Prevention	15	3.5%	15	4.5%	15	5%	0	0	1	.8%
High Blood Pressure	0	0	5	1.5%	6	2%	0	0	1	.8%
Smoking	0	0	2	0.5%	0	0	1	5%	0	0
Nutrition	6	1.5%	4	1.0%	174	57%	0	0	1	.8%
Physical Fitness and Exercice	2	0.5%	23	6.5%	3	.5%	0	0	2	1.6%
Stress Control	4	1.0%	3	1.0%	0	0	0	0	0	0

FACULTY HEALTH AND WELLNESS

In addition to working towards an improvement of the faculty knowledge base regarding Health Promotion and Disease Prevention in preparation for curriculum modification, the project also adopted the philosophy that faculty should serve as role models by displaying a healthy lifestyle. Again, it was necessary to establish a baseline with which to compare change, if any, over the duration of the project. Dr. Kathleen Grady, a psychologist and the project evaluator, assumed the primary responsibility for this activity. She used an instrument from the Blue Cross and Blue Shield Guide to Staying Well because it stressed the content and behavior areas which are the foci of the project. This instrument, "The Life Management Self-Evaluation Test" (Appendix B) allows the summation of point totals for each subscale. The range of scores possible is: 0 to 48 for Nutrition; -20 to 48 for Fitness; 0 to 42 for Personality/Stress; and -49 to 50 for Lifestyle. Similarly, subscale scores are summed to yield an overall wellness score. A total of 40 faculty and staff in the School of Allied Health responded to the questionnaire. In order to provide a basis for comparison with a similar population, the same questionnaire was distributed at a faculty meeting of the School of Family Studies with 23 faculty responding. Table III summarized the overall wellness scores of each group. Although 51% of the Allied Health group scored in the excellent category as opposed to only 32% of those in Family Studies with a correspondingly lower percentage (18% vs. 32%) in the unsatisfactory category, a chi-square analysis indicated that the differences were not significant. A comparison of the subscale scores between the groups (Table IV) indicated a significant difference only in the fitness category. Even in this category, however, the Allied Health group scored about 26 points below the maximum achievable score of 50. Similarly, in comparison to the achievable scores on the other subscales, significant room for improvement exists in both groups. Since Allied Health faculty and staff have been and will continue to be exposed to educational programs (seminars and workshops), while those in Family Studies will not, it will be interesting to see the scores attached by both groups at the end of the current project.

TABLE III
OVERALL WELLNESS

	Unsatisfactory	Satisfactory	Excellent
Allied Health	18%	31%	51%
Family Studies	32%	37%	32%

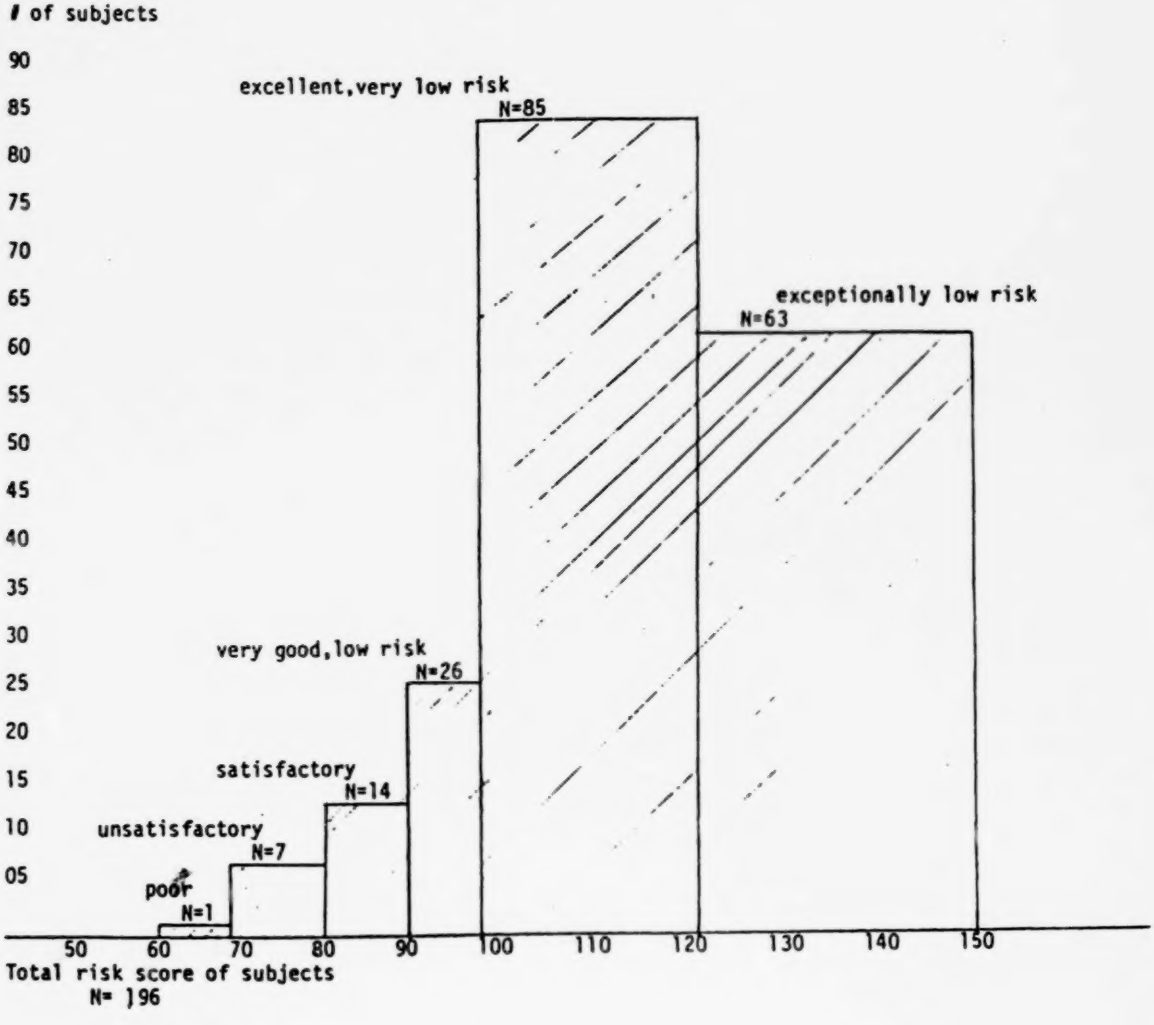
TABLE IV
A COMPARISON OF SCORES ON THE SUBSCALES

	Allied Health	Family Studies	t-test
Nutrition	30.88	33.22	-1.10 (n.s.)
Fitness	23.77	17.95	2.20 (p .05)
Personality/Stress	20.30	23.00	-1.62 (n.s.)
Lifestyle	22.58	18.17	1.51 (n.s.)

STUDENT HEALTH AND WELLNESS

Utilizing the same questionnaire from Blue Cross and Blue Shield, Mrs. Susan Gibbons, R.P.T. of the Project Staff carried out a study of the health habits of 196 upper division students in the School of Allied Health Professions. She was assisted in this study by Ms. Janet DePaola, Associate Project Coordinator; Dr. Susan Rovezzi-Carroll, the Project Evaluator at this time; Dr. Priscilla Douglas, Project Co-Director; and Ms. Gibbons, Graduate Program Advisor. Faculty from each of the professional programs assisted with the administration of the questionnaire. Physical Therapy students accounted for 131, Clinical Dietetics students for 34 and Medical Laboratory Sciences students for 31 of the subjects in the population. The distribution of the total scores for the entire population is presented in figure 1.

FIGURE 1: Distribution of Health and Wellness Scores of students, School of Allied Health



The vast majority (88.7% or 174) received health risk ratings of very good or above. Only 32% of the students, however, scored in the exceptionally low risk category and 11.2% scored satisfactory or below. This indicates room for improvement.

A comparison of the scores attained on each of the subsections of the instrument among the three groups of students studied indicated that the Clinical Dietetics students scored significantly higher than either the Physical Therapy or Medical Laboratory Sciences students on Nutrition. There was no significant difference among or between the groups on the remaining subsections.

SURVEY OF CLINICAL AFFILIATION SITES

A survey instrument was designed to obtain information regarding interest in continuing education programs in Health Promotion/Disease Prevention; clinician expertise and willingness to assist in the development and implementation of such programs; the type and target populations for HP/DP programming at each clinic; the current amount of involvement of students in such activities; and/or the willingness to involve students in HP/DP programs as part of their clinical experiences. A copy of the questionnaire is given in Appendix C. The directors of each professional program (Clinical Dietetics, Medical; Laboratory Sciences and Physical Therapy) were asked for input regarding the questionnaire as well as for cooperation in contacting the supervisors of each clinic. Approximately 100 questionnaires were sent to Physical Therapy affiliation sites. The return rate, following a second mailing was 77%. Similarly, 20 Clinical Dietetics sites received questionnaires resulting, also after a second mailing, in a return rate of 85%. Ten (10) Medical Laboratory Science clinical sites were contacted, with follow-up mailing, yielding a return rate of 70%. The latter group was also asked about preventative screening activities and interest since laboratories were believed to be more likely to be active in this area than are the other disciplines. The data obtained was analyzed by Dr. Rovezzi-Carroll with the assistance of Mrs. Gibbons.

The data regarding either the need for or the interest in continuing education programming at Physical Therapy clinics is summarized in Table V. The primary interests were for programming in Physical Fitness/Exercise (59%) and Stress Management (54%). Approximately 31% of the respondents indicated expertise in Health Promotion and a willingness to share it.

TABLE V
NEED FOR/INTEREST IN THIS HEALTH PROMOTION AREA:
PHYSICAL THERAPY CLINICAL SITES

HP Area	Percentage	Number
Physical Fitness/Exercise	59	45
Smoking and Health	14	11
High Blood Pressure Control	26	20
Nutrition	34	26
Stress Management	54	41

Table VI summarizes the results regarding numbers, types and target populations of HP/DP efforts by the clinical sites. While the total amount of activity in all of the priority areas is quite high, it should be noted that only twenty of the sites were responsible for most of this activity, clearly indicating room for improvement for this professional group. Physical Therapy students at the sites surveyed appear to have little opportunity to practice health promotion activities and about 45% of the responding clinicians were ambivalent about providing these opportunities. Most of these were non-committed (36%) and the rest (9%) were negative.

TABLE VI
MATRIX OF CHECKS (✓) FOR HP AREA AND POPULATIONS:
PHYSICAL THERAPY CLINICAL SITES

HP Area	Patient	Community	Staff	Other
Physical Fitness & Exercise	12	18	24	5
Smoking and Health	9	16	27	3
High Blood Pressure Control	14	12	16	3
Nutrition	15	16	22	4
Stress Management	6	1	18	6

The need for/interest in HP/DP results for the Clinical Dietetics affiliates are presented in Table VII. As was the case for Physical Therapy, the main interests were in the area of Physical Fitness/Exercise and Stress Reduction. With regard to health promotion expertise/willingness to share, only one (1) respondent answered affirmatively while 7 (46%) indicated they might "possibly" be interested in the future.

TABLE VII
NEED AND INTEREST IN HEALTH PROMOTION TOPICS:
CLINICAL DIETETICS CLINICAL SITES

HP Area	Percentage	Number
Physical Fitness & Exercise	31	11
Smoking	14	5
High Blood Pressure	14	5
Nutrition	14	5
Stress	31	11

Table VIII summarizes the data for numbers, types and target populations for HP/DP programming at the sites. As was the case for Physical Therapy, it should be noted that most of this activity was reported by only five of the seventeen responding affiliates, indicating room for change in the remainder. Student involvement in HP/DP activities at the Clinical Dietetics sites was higher than for Physical Therapy, with 59% reporting positively. The types of activities were, however, primarily nutrition oriented rather than cutting across the spectrum of possible activities. Despite the high level of student involvement reported, only 41% (7) of the respondents replied affirmatively when asked if senior level students could be more involved in HP/DP. One (1) said "no", two (2) said "possibly" and the remaining 7 (41%) did not respond.

TABLE VIII
MATRIX OF TYPE OF PROGRAM BY TARGET SAMPLES: CLINICAL DIETETICS CLINICAL SITES

HP Area	Patient	Community	Employees	Total
Physical Fitness/ Exercise	2	3	8	13
Smoking	0	3	3	6
High Blood Pressure	3	2	4	9
Nutrition	7	5	9	21
Stress	0	1	5	6
Total	12	14	29	55

Need for or interest in HP/DP topics at the Medical Laboratory Clinical sites surveyed is presented in Table IX. Only five of the seven respondents completed this part of the questionnaire. Unlike the Clinical Dietetics and Physical Therapy respondents, there appeared to be limited interest in Physical Fitness/Exercise, no interest in Smoking and Blood Pressure Control, and very high levels of interest in Stress Management (71%) and Nutrition (57%).

TABLE IX
NEED AND INTEREST IN HEALTH PROMOTION TOPICS: MEDICAL LABORATORY CLINICAL SITES

HP Area	Percentage	Number
Physical Fitness	29	2
Smoking	0	0
Blood Pressure	0	0
Nutrition	57	4
Stress	71	5

The comparatively lower levels of interest in Fitness, Smoking and High Blood Pressure Control may be due to the fairly high levels of programming in these areas for the Community and Employees of the responding clinics (see Table X).

TABLE X
MATRIX OF TYPE OF PROGRAM BY TARGET SAMPLES: MEDICAL LABORATORY CLINICAL SITES

HP Area	Patient	Community	Employees	Total
Physical Fitness/ Exercise	3	2	4	9
Smoking	2	5	3	10
High Blood Pressure	3	4	4	11
Nutrition	0	2	2	4
Stress	2	5	5	12
Preventative Screening	2	2	2	6
Total	12	20	20	52

Nutrition programming, similarly, is reported to be relatively low at these locations, possibly explaining the high perceived need. Stress management programming, however, was reported as being high, yet the respondents expressed a need for more information on the earlier section. Clearly, more data is required from this group, particularly with respect to Stress Control. None of the Medical Laboratory Scientists responding felt that they had sufficient expertise to conduct or assist with workshops or other programming on the priority areas listed on the questionnaire, perhaps indicating a need for educational programming. This, however, is contradicted by the responses relating to interest in these areas. When asked about opportunities for students to participate in HP/DP activities, 4 (57%) of the respondents indicated that their students were involved. These experiences were, however, primarily confined to laboratory-oriented types of activities, such as Screening for Blood Type and participation in National Laboratory Week. Interestingly, in light of the other results, two respondents indicated student involvement in Nutrition, High Blood Pressure and Aerobics programs offered by the facilities. Only three of the respondents indicated some willingness to involve future students in HP/DP activities, two were not interested at all and the remaining two did not respond.

SUMMARY AND CONCLUSIONS

The curriculum survey appears to indicate a need for increases differing by program, in the amount of content and practical skills offered to students during their professional preparation. Wellness, Disease Prevention, High Blood Pressure Control and Stress Management information appears necessary for all curricula. In addition, the Clinical Dietetics and Medical Laboratory Sciences programs are low with respect to Physical Fitness/Exercise and Physical Therapy and Medical Laboratory Sciences seem to need more work in the area of Nutrition. The goal of this project is work with each program in an attempt, whenever possible, to incorporate the appropriate material into the respective curricula. Where this is not possible, we hope to expand the scope of Allied Health or Health Science courses to achieve these ends.

The faculty wellness scores, as mentioned earlier, show that room for immprovement exists. Over the course of the project to date, faculty have participated in workshops on each of the priority areas with the exception of Physical Fitness and Exercise. A workshop dealing with this is scheduled for January, 1986. During the Spring of 1986, the faculty will be asked to complete the same health questionnaire and the results obtained will be compared to the results herein reported to ascertain whether improvement has occurred. Ideally, a similar process should occur with the students. The project has offered seminars over the last two years, developed a resource collection and urged interested students to focus on HP/DP topics in some courses and in independent study. An entire week of activities was offered last Spring and many of our students participated. Presumably, these events have at least heightened awareness in the population and may have altered behavior in some. Unfortunately, at this time, we have no resources to allow a follow-up of the students surveyed a year ago.

The Clinical Site Survey data indicate an interest from all the disciplines in programming for Stress Reduction. Physical Fitness and Exercise are of high interest among Physical Therapy and Clinical Dietetics practitioners and Nutrition appears to be of strong interest among Laboratory Scientists. Over the course of the final year of the project, we will be developing, with further input from clinicians, continuing education opportunities for each population. Resources will be drawn from our faculty and from those clinicians expressing an interest in involvement. Similarly, we will contact those individuals with opportunities or an interest in providing experience for senior level students in HP/DP at their sites and share the data with clinical placement personnel in the programs to match students with sites.

INTERPROFESSIONAL COLLABORATION IN THE ANALYSIS OF PUBLIC POLICY: METHODS, PROCESS AND PRODUCT

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ABSTRACT

The paper interprets the Commission's collaborative program by describing a two year study of Alternative Modes of Reproduction by an interprofessional public policy panel and its impact on the state legislative process.

INTRODUCTION

Interprofessional public policy analysis at The Ohio State University has developed as a program of the Assembly of the Commission on Interprofessional Education and Practice of The Ohio State University. The Assembly is an organization of representatives from professional schools and professional associations from all regions of Ohio. The purpose of the Assembly is to provide a structure which enables professionals to collaborate in the interprofessional analysis of critical public issues for which there is either no public policy or inadequate public policy. The assumption of the Assembly is that professionals have a societal responsibility which transcends the intra-professional interests of the respective professions and requires interprofessional collaboration in the pursuit of the common good.

POLICY PANELS

The Assembly seeks to accomplish the overall purpose of exploring social issues thoroughly and comprehensively by creating public policy analysis panels. Each panel is comprised of sixteen persons selected from eight of the professions which have membership in the Assembly. Each of the eight professions is represented on the panel by a team of two persons. Eight of the panelists are recruited from the Assembly representatives with the understanding that each of those eight will recruit a professional partner who has special interest or expertise in the issue to be explored. Selection of the chairperson is usually made early on in the recruitment by the Commission staff in consultation with the Commission leadership.

In the actual working of an interprofessional policy panel the leadership rotates among the members as the life of the panel has different needs at different times. Of course, the formal leadership is fixed in the chairperson but the functional leadership occurs as the peculiar expertise or experience of a panelist is relevant for a specific task.

POLICY ANALYSIS

The interprofessional analysis of public policy requires that each panel address the following objectives: 1) inspection and understanding of the issue from the intra-professional perspective of the panelists; 2) exploration and analysis of the importance of the issue for interprofessional education and practice; and 3) preparation of a policy informing document that is available to Commission constituency, policy makers, and the general public.

The inspection and understanding of the issue from the intra-professional perspectives of the panelists is an essential first step in interprofessional public policy analysis. In the first place, it provides the panelists an opportunity to educate each other in their specialized areas of knowledge concerning the issue under investigation. In the second place, the sharing of intra-professional perspectives sensitizes the panelists to the complexities of the issue and to the societal dimensions of the problem which transcend the competencies of any one profession.

Once the panelists are introduced to the special areas of knowledge concerning the issue and made aware of its complexity and critical social implications they are prepared to explore and analyze it interprofessionally. Since intra-professional inspection and understanding confront the panelists with the limits of their own knowledge and skill, they are open to the possibility of developing a more comprehensive body of knowledge interprofessionally and to acquiring those skills which are essential for interprofessional collaboration. The process of dialogue, challenge, correction and modification which characterizes the working of a panel enables the panelists to experience the intellectual stimulation and the personal fulfillment of intensive participation in a program of social change through education. In a profound sense, the panels gather together all the concerns of interprofessional education and practice and carry them forward at a high level of conceptualization and practice. Panelists are very conscious of this process and committed to promoting it so that they will experience with their colleagues the excitement and rewards of interprofessional reflection and action.

The specific tasks which each panel has in view as it moves from intra-professional inspection and understanding of an issue to interprofessional exploration and analysis is the preparation of a policy informing document that is available to policy makers and the general public. Policy informing papers are written in the form of model policy documents to facilitate the dissemination of the panelists' understanding of how issues in the larger society might be understood and appropriate legislation and/or policy drafted in response thereto. The documents are intelligence papers and not advocacy statements. Neither the Commission nor any of its constituent parts endorses the work of the policy panels from an advocacy perspective. As policy informing documents they attempt to provide prospective analysis of issues which will enable legislators and other policy makers to make decisions on the basis of broad considerations of the common good instead of in response to the narrow concerns of special interest groups.

METHODS

Each panel is recruited for the purpose and objectives as indicated above. The panels, however, have their own unique character and develop their own integrity and their own procedures. Generally, the members commit themselves for a two-year period with the understanding that they will have control over frequency of meetings, schedule of tasks, and format of final document. The three panels now in existence have each conceived their work differently: the Alternative Modes of Reproduction Panel is producing model legislation; the Health Care Costs Panel is designing a grid for evaluating the outcomes of various cost containment strategies; and the Family Violence Panel is cataloging educational resources, designing a model curriculum, and exploring the philosophical presuppositions of the use, restriction, and rejection of violence. The result of the Alternative Modes of Reproduction Panel will be highlighted at a major Commission continuing education conference and a publisher is interested in a book growing out of the panel's work. In short, the panels are focused from the beginning on producing a significant "policy informing" document which takes shape according to the vision and self-understanding of each panel.

OUTCOMES

It is far too early to make definitive estimates of the value of interprofessional policy analysis for the human community but the following tentative assessment seems to be in order. First, the panels, as far as we know, are currently challenging our society. Second, the interprofessional membership of the panels provides an arena for the analysis of public issues which promises to serve the public better than the limited self-interest of intra-professional lobbying. Third, the generation of public policy informing documents is an innovative attempt to make the results of thoughtful discussion of crucial issues available to policy makers before they are pressured to react to demands for quick and simple solutions to long range and complex problems.

Public policy formulation is an ongoing process which demands the expertise and commitment of persons who have a high stake in improving the quality of our corporate existence. Professionals share in responsibility for this task but have lacked a framework which would enable them to work persistently at policy issues without duplicating or competing with the efforts of other highly motivated persons. The Commission's experimentation with interprofessional public policy analysis may serve to provide a structural model for highly skilled persons in the helping professions to cooperate in the national quest for excellence. At any rate, the work of the panels to date is surely an example of how professionals are able to collaborate in giving more than lip service to the spirit of excellence in human service policy.

The raising of standards for professional practice and the constant effort to improve the quality of education in the nation's professional schools have combined to produce an unparalleled corps of professionals for serving individual needs. This concentration on response to personal needs has not been matched by a corresponding emphasis upon societal needs. Professionals represent a tremendous untapped pool of talent for creative response to societal problems. The Commission's program of interprofessional public policy analysis is beginning to tap this resource. The panels not only bring professionals together for the analysis of public issues; they also teach them how to deepen their own understanding of those issues and train them in developing collaborative strategies for generating and improving public policy. The experience of panel members is that the collaborative effort enables them to determine what needs to be done and to help move the society toward implementation of proposed action.

One of the persistent challenges of interprofessional education and practice is the development of models for interprofessional practice. If response to societal needs is a responsibility of those in the helping professions, then the interprofessional public policy panel is one model for fulfilling that responsibility. The panels are task oriented but as members address their specific tasks they are required by the interprofessional composition of the panels to grow in understanding of their own professional contribution, the contributions of others, the skills required for collaborative effort, and the strategies which enable professionals to influence the formulation of public policy. Thus, the panels are laboratories where the idea of interprofessional practice is tested, refined, and implemented. Practice is constantly subjected to rigorous theoretical examination and theory is required to meet the acid test of practice.

Professional people tend to be bright and creative but they are often frustrated by the routine responsibilities of daily practice. The interprofessional public policy panels meet the intellectual needs of such people by confronting them with new challenges. offering them opportunities for developing new interests and skills, and raising them to new levels of awareness of the needs of persons and society. It seems that panel members find the interprofessional experience not only stimulating and renewing in itself but also transferable to their intra-professional practice.

Although the panels are created for a specific task and have a limited life-span, they bring into existence a network of highly skilled persons who are on call for future use. The personal relationships developed and nurtured between and among panelists are life-changing and enduring. Attitudes of openness, sensitivity, commitment, and public responsibility are invaluable resources which the panels release into the society at large and which are in place when critical problems arise.

Each panelist becomes an embodiment and advocate for interprofessional education and practice. The initial commitment of the Commission to education is honored in the public policy panels as the panelists are simultaneously teachers and students. The process of shared responsibility, mutual support, community consciousness, and common commitment is an educational environment enabling persons to achieve wholeness in the pursuit of personal and social excellence. The rewards are intrinsic so that the panels are structures in which the expansion of the idea is realized in the growth and development of the persons.

SURVEYING RESEARCH INTERESTS OF ALLIED HEALTH PROFESSIONALS

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ABSTRACT

As health care delivery becomes more sophisticated, there is an increasing demand for applied research to validate methods/approaches used in everyday practice. Health professionals seem best suited to conduct studies related to their own fields. These professionals often express interest in doing research, yet many of the published articles in the respective professional journals and major presentations at national meetings are authored by physicians and others outside the field. One may ask whether health professionals actually engage in applied research studies, publish or present their work in other settings, possess the necessary skills, and work in an environment where research is encouraged/supported.

A study was conducted to ascertain the research interests of clinical dietitians. Registered dietitian members of the American Society for Enteral and Parenteral Nutrition were chosen as the survey population. This group comprises about 5% of clinical dietitians and generally engages in "progressive" clinical practice.

A questionnaire was developed and sent to all 1200 members of the survey population; responses were received from 439 individuals. A summary of research findings will be presented including demographic information, involvement in research studies, research interests and needs, and characteristic research environments.

The survey instrument could easily be adapted for use by an allied health group. A study could also be designed to identify differences between health professions or specific needs of faculty members or clinical practitioners in different kinds of settings.

INTRODUCTION

Today I want to share with you a study of clinical dietitians which I conducted and show how such a study could be adapted for other allied health programs.

The impetus for my study came last January at a meeting of the American Society for Parenteral and Enteral Nutrition (ASPEN). At that meeting I was struck with what seemed to be poor representation of dietitians as presenters and faculty members for the postgraduate sessions. I wondered if that program was typical of dietitian involvement in research. On my way home I decided to conduct a study to document the research and scholarly activities of dietitians and ascertain the need for continuing education on research fundamentals.

To understand the significance of this study it is important to remember that dietetics changed dramatically in 1974 after a skeleton was discovered in the hospital closet (1). Hospital malnutrition, unnoticed for so long, was finally recognized as a major contributing factor in mortality and morbidity following trauma, surgery, sepsis and burns. The prevalence (2) and severity of the problem (3) triggered activity in three major arenas.

First, THE AMERICAN SOCIETY FOR PARENTERAL AND ENTERAL NUTRITION (ASPEN) was established. This professional society is comprised of health care professionals including physicians, nurses, dietitians, pharmacists and nutritionists who are dedicated to optimum nutritional support of patients during hospitalization and rehabilitation. The diverse professional membership of ASPEN indicates that a multidisciplinary team approach is important for sound nutrition support; the dietitian is no longer solely responsible for the provision of comprehensive nutritional care.

Second, new role expectations were created for dietitian members of nutrition support teams (4). Job descriptions focused activities on nutritional assessment, consultation, documentation and monitoring of nutrition support for a small group of patients known to be at nutritional risk. These dietitians are often freed from the responsibility for routine assignments associated with diet therapy and patient food service. Because of their specialized focus, nutrition support dietitians are looked upon as leaders in the profession. They, more than others, are expected to be on the cutting edge of nutritional care for the critically ill.

Third, the emergence of nutrition support teams accentuated the need to upgrade the role of all clinical dietitians. The American Dietetic Association (ADA) undertook a role delineation study and defined new standards of practice for clinical dietitians (5). The new role highlighting such professional functions as managing nutrition care processes and services; educating other health professionals; coordinating nutrition care activities; participating as members of health care teams; conducting applied research; and maintaining skill and knowledge in optimal nutrition care.(6)

Increased emphasis is being placed on participation in applied research. Scientific advancement in nutrition support is a primary objective for ASPEN and its members. Clinical dietitians seem to lag behind other nutrition support professionals in achieving this objective (7). For example, at the 1985 ASPEN Clinical Congress only 19.2% of the faculty and 6.9% of abstract authors were registered dietitians, even though dietitians comprise one-fourth of the ASPEN membership (8).

BACKGROUND OF THE PROBLEM

A search of the literature failed to uncover any previous studies dealing directly with dietitians' research interests. Pertinent literature relates to role expectations, lack of attention to research activities in role studies, present involvement of dietitians in clinical research and scholarly activity, new skills needed for effective dietetic practice and the need for stronger educational programs, including the development of research skills.

Role expectations

Several decades ago MacEachan (9) emphasized the need for dietitians to be involved in research. During the mid-1960's, many articles affirmed individual (10) and departmental (11,12) responsibilities for research. Dietitians were encouraged to become clinical nutrition specialists involved primarily in sophisticated dietetic services of initiating assessment of nutritional status, identifying and diagnosing nutrition problems, teaching/counseling patients, educating team members participating in research and managing the complete range of nutrition services (13,14). It was demonstrated that, when given administrative support, dietitians used specialized professional and research skills (15-17). However, a recent study of the profession showed that more than two-thirds of those surveyed had responsibility for conventional care of patients and most dietitians indicated they were satisifed with their roles (18).

Research lacks attention

Attention to research activities is frequently omitted from studies of the clinical role. For example, Calvert, Parish and Oliver (19) found that most health professionals desired dietitians to be more actively involved in direct patient care functions, interacting with medical staff, coordinating diet plans and participating in medical team activities. Although the research design provided for open-ended responses, participation in clinical research was not mentioned as a present function, desired function, or as a factor associated with the image of the dietitian. The study verified, however, that routine tasks rather than professional activities (including research) still occupy much of the dietitian's time and energy.

McManners and Barina (20) conducted a study to define productivity standards for clinical dietitians. Standards of dietetic care, including menu production, basic care, diet therapy, and metabolic support, were established with time requirements for each activity. Dietitians recorded additional functions for which they were responsible. Neither the regular activities nor the additional functions included clinical research activity. Participation in clinical research was also omitted from another study to identify operational, functional and additudinal factors associated with clinical dietetic practice and the professional image of dietitians (21).

Limited research activity

A few studies have reported dietitian involvement in research. In the 1981 census of the ADA, 15% of members reported spending time in research; of these, 84.3% said they devoted 1-10 hours per week to this activity (22). Another study revealed that dietitians devoted an average of only 3.5 hours per month in professional activities such as "continuing education programs, library research, and inservice education programs" (23). Several years ago Noland and Steinberg (24) reported that therapeutic dietitians spend 0.6% of their time conducting research. More recently, Kris-Etherton, et al, (25) found that clinical dietitians spent little or no time in designing and participating in research projects and placed little importance on research in their practices.

Schwartz (26) reported that 63.5% of dietitians agreed that participating in team research projects should be part of their regular responsibilities. She also noted that almost 90% of nursing directors and nearly 80% of medical directors expected dietitians to participate in research, but only 60% of administrators expected them to do so.

New skills needed

Clinical dietitians have been challenged to document their effectiveness and improve their visibility (27). Dietitians have strong competition from other health professionals who are strategic members of nutrition support teams. These health professionals exhibit a growing interest in nutrition and a desire for more nutrition training (28). The advanced training of other health care team members such as physicians and pharmacists can no longer be matched by the average baccalaureate-level clinical dietitian (29). New competencies have been established for clinical dietetic practice, including participation in applied research studies (30-33).

Educational needs

There are indications in the literature that many dietitians lack the education and training necessary to carry out their new responsibilities (27), including the ability to conduct research (34,35). Seal, et al, (36) reported that a master's degree is needed to prepare individuals to conduct or direct research projects.

The final report of the 1985 Study Commission on Dietetics recommended that all dietitians have a more rigorous education (37). It was suggested that advanced education is necessary for every dietitian, whether that individual functions as a generalist or a specialist. The importance of continuing education was also highlighted. The report concluded that one of the limiting factors in dietetic education today is the lack of an adequate research base for the profession.

METHODOLOGY

A study was undertaken to assess the research involvement, interest, preparation and educational needs of clinical dietitians. The objectives of the study were to: a) ascertain the current research activities of clinical dietitians, b) determine the personal interests of clinical dietitians in additional research activities and collaborative studies, c) characterize the research environment of clinical dietitians, and d) determine the need for continuing education programs on research fundamentals.

The Survey Instrument

A questionnaire was developed to collect data from clinical dietitians (Appendix D). The questionnaire was divided into four sections. The first section included demographic information, including level of education and research experiences which were part of the formal education program. The second section dealt with professional involvement such as proposals written, studies conducted, presentations made and reports published. The third part focused on research interests and needs, including the desire for involvement in collaborative research and topics of interest. There were also questions relating to the need for additional research skills and preference for continuing education activities to enhance skill development. The fourth section addressed the research environment and provided information on factors which influence research involvement other than proficiency in conducting research.

Subjects

The survey instrument was sent to the 1200 clinical dietitians who are members of ASPEN. This sample population included all dietitian members of ASPEN but represented only 6.2% of registered dietitians who classify themselves as clinical dietitians (18) Although this sample was not representative of all dietitians, the total dietitian membership in ASPEN was selected as the survey population because these dietitians represent leadership in the profession. They are more likely to be interested in clinical research and they have a responsibility for conducting research with the nutrition support team. It was assumed that this group of dietitians would also have the greatest need for continuing education in research fundamentals. A decision was made to survey all dietitian members of ASPEN (rather than a random sample) to provide more reliable and complete data on this select group of individuals.

Because of the large sample size, there was no plan for follow-up correspondence. However, because these clinical dietitians are thought to have a particular interest in clinical practice, it was anticipated that more than 50% of the sample would return the questionnaire.

Data Analysis

Responses from the completed survey instruments were entered into the computer using WILBUR and the Statistical Package for the Social Sciences (SPSS). Frequency distributions and means (where appropriate) were calculated for each item on the questionnaire.

FINDINGS AND DISCUSSION

TABLE I
Demographic Characteristics of Survey Participants

Item	Number	% of Respondents
Years as ASPEN member		
3 or less	251	59.2
4 - 7	151	35.6
8 or more	22	5.2
Attended ASPEN Clinical Congress		
1984	128	30.2
1985	161	38.0
Member ADA Critical Care Dietitians	246	58.0
Highest level of education		
Baccalaureate	141	33.3
Masters in progress	59	13.9
Masters completed	201	47.4
Doctorate in progress	16	3.8
Doctorate completed	7	1.7
Completion of entry-level experience requirements		
Coordinated program	89	21.0
BS plus Dietetic Internship	227	53.5
Masters plus 6 months practice	50	11.8
Masters with assistantship	17	4.0
Other	41	9.7

Completed questionnaires were received from 434 participants for a response rate of 36%. As shown in Table I, a majority of respondents had been members of ASPEN less than four years, did not attend the ASPEN Clinical Congress in either 1984 or 1985, maintain membership in the ADA Practice Group for Critical Care Dietitians, completed a dietetic internship and hold a masters degree.

Although it is not required for credentialing, a large number of registered dietitians have pursued graduate education. Overall, 29% of employed dietitians hold a master's degree and another 30% have done some graduate work (18). It should be noted, however, that many dietitians use the master's degree to meet basic requirements for registration eligibility (38). It is unknown whether these entry-level graduate degree programs also prepare dietitians to conduct research, pursue specialization, or initiate advanced practice in clinical dietetics.

TABLE II
Preparation For Research

Item	Number	% of Respondents
Undergraduate curriculum		
Statistics course(s)	223	52.6
Research methods course(s)	86	20.3
Graduate curriculum		
Statistics course(s)	195	46.0
Research methods course(s)	182	42.9
Other experiences (units, seminars)	30	7.1
Research projects		
Undergraduate research project	186	43.9
Masters thesis	122	28.8
Masters non-thesis project	106	25.0
Internship research project	93	21.9
Doctoral dissertation	13	3.1
Other research experiences	34	8.0
No research experiences	55	13.0

More than half of the respondents completed an undergraduate course in statistics but only 20.3% had a course in research methods (Table II). However, 43.9% completed an undergraduate research project and 21.9% did a research project during their dietetic internship.

Forty-six percent of respondents took one or more graduate statistics course(s) and 42.9% completed at least one course in research methodology. More than half of the group (53.8%) completed a masters thesis or other graduate research project and 3.1% finished a doctoral dissertation.

Several respondents indicated they had other research-related experiences besides formal courses (7.1%) and designated research projects (8%). Only 13% of the group said they had no research experiences as part of their formal education.

Most participants in this study (54%) said they devote no time to research and 33.3% reported spending 1-5 hours per week in research activities (Table III). Several (12.7%) said they spend more than six hours per week doing research; ten individuals reported giving 40 or more hours per week to research activities.

Demographic information failed to segment respondents who held positions as "research dietitians". Since about ten percent of respondents said they devote more than eight hours per week to research, we can assume this group has job descriptions in which research is a primary responsibility. We can deduce, then, that about half of the twenty percent who reported they wrote proposals, published articles and presented papers hold positions as "research dietitians" and are not struggling to juggle the demands of clinical practice and research.

On the whole, dietitian members of ASPEN appear to devote more time to research than other dietitians. In 1981 only 15% of ADA members reported involvement in research activities (22). By comparison, 46% of respondents in this study said they devote some time to research. The mean time reported was 3.5 hours per week or 8.7% of average work time.

TABLE III

Time Devoted to Research Activities

Hours per week	Number	% of Respondents
None	229	54.0
1-5	141	33.3
6-16	30	7.0
17-50	24	5.7
Desire to spend less time	6	1.4
Desire to spend more time	316	74.5
Satisfied with time allocation	78	18.4
No response	24	5.7

During the past two years 11.6% of respondents served as principal investigator (PI) for one study and 7% took responsibility for 2-6 clinical studies (Table IV). A larger number (26.6%) were coinvestigators and were involved in 1-12 studies.

Sixty seven respondents (15.8%) had written research proposals (PI) in the past two years; 5.4% received funding and 8% had proposals approved without funding. Seventeen percent of the sample worked as coinvestigators; 10.9% received funding and 9.4% obtained approval without funding. It appears those who work as secondary members of research teams are more successful in obtaining funding and approval than those who serve as principal investigators. This could be reflective of the need to have physicians provide leadership for clinical research, or it could point to inadequate skills in research design and proposal writing.

Many dietitians apparently play a supportive role in research. Nearly 30% collected data for other investigators and 15.9% surveyed the literature for studies but were not listed as authors.

TABLE IV
Research Involvement For Past Two Years

Item	Number	% of Respondents
Principal investigator (1-6 projects)	79	18.6
Coinvestigator (1-12 projects)	113	26.6
Assisted others (1-60 projects)	124	29.2
Surveyed the literature		
Principal investigator (1-12 projects)	82	19.3
Coinvestigator (1-13 projects)	91	21.5
Assist others (1-15 projects)	68	16.0
Proposal development		
Principal investigator		
Written (1-7)	67	15.8
Funded (1-6)	23	5.4
Approved w/o funding	34	8.0
Coinvestigator		
Written (1-5)	72	17.0
Funded (1-4)	46	10.9
Approved w/o funding	40	9.4

TABLE V
Presentations and Publications

Item	Number	% of Respondents
Presentations		
Scientific research papers (1-5)	22	5.1
Symposia, major sessions (1-10)	70	16.5
Poster sessions (1-6)	75	17.7
Round table (1-4)	31	7.3
Other (1-4)	12	2.8
Publications		
Research articles		
Primary author (1-9)	44	10.3
Supporting author (1-13)	60	14.2
Other articles	90	23.3

As shown in Table V, 21.6% of respondents gave scientific papers or gave major presentations at national meetings. Numerous others (37.2%) presented poster sessions, case studies, round table discussions or took other leadership roles at professional conferences.

One-fourth of respondents had published research articles with 10.3% serving as primary author for 1-9 articles and 14.2% serving as coauthors for 1-13 articles. In addition, 23.3% authored other publications such as abstracts or review articles. While most respondents published only one such piece, others authored 2-12 items in this category.

A large proportion (83.8%) of dietitians in this study expressed interest in collaborative research studies (Table VI). Most preferred working with clinical investigations (64.9%) but dietitians also indicated a desire to participate in several other types of studies.

TABLE VI

Interest in Collaborative Research

Interest	Number	% of Respondents
Interested in collaborative studies	336	83.8
Organize group/write proposals	60	14.2
Serve as coinvestigator	211	49.8
Collect data as requested	249	58.7
Preferred type of study		
Metabolic studies	198	46.7
Intake studies	133	31.4
Clinical studies	275	64.9
Survey studies	126	29.7
Education studies	103	24.3
Other	12	2.8

The "needed" research skill cited most often was proficiency in statistical analyses of data (Table VII). Other popular "needed" skills included ability to obtain funding, get published, develop research designs and write proposals or protocols. More than half of respondents completed an undergraduate course in statistics and nearly half had at least one graduate statistics course. Yet, proficiency in statistical analysis of data was the skill mentioned most often as needed by respondents in this study. Apparently, students do not comprehend fundamental concepts of statistics or they fail to appreciate their relevance. Perhaps statistics should be taught as continuing education when professionals are motivated by "the need to know". The immediate application of principles to current studies would help to reinforce the concepts and facilitate retention. More than half of the respondents expressed interest in regional seminars (54.2%) and courses/workshops at national meetings (52.8%) as a means of improving their research skills (Table VIII). These findings indicate that dietitians would also take advantage of other continuing education opportunities.

A profile of research environments indicates that a personal interest in research received a higher median score than any other factor (Table IX). However, research was given low priority in the work setting and was not financially or administratively supported in most instances. This finding is consistent with perceptions reported by Schwartz (26) indicating that administrators expect dietitians to spend their time providing for nutritional care needs of patients.

TABLE VII
Research Skills Needed

Skill Needed	Number	% of Respondents
Statistical analysis of data	321	88.2
How to obtain funding	333	78.5
Getting paper published	262	61.8
Developing research design	258	60.8
Writing a proposal	247	58.3
Writing research protocols	214	50.5
Writing a paper/abstract	174	47.3
Defining research objectives	160	37.7
Presenting a paper	149	35.1
Identifying research problems	120	28.3
Data collection	104	24.5
Other	4	.9

TABLE VIII
Interest in Research-related Continuing Education Activities

Type of Event	Number	% of Respondents
Regional seminars	230	54.2
Postgraduate course at national meetings	224	52.8
Self-instructional materials	183	43.2
Individual consultation	158	37.3
Correspondence course	147	34.7
Other	11	2.6

TABLE IX
Median Scores Characterizing Research Environments

Characteristic	High 7 … Low 1	Mean
Research rewarded	. . . .x . . .	3.9
Research given priority	. . . . x. . .	3.1
Professional resources available	. . . x. . . .	4.2
Personal interest in research	. . x	5.5
Many research opportunities	. . . x. . . .	4.1
Computer is accessible	. . . x. . . .	4.1
Research is financially/ administratively supported	. . . . .x . .	2.9
Department supports research	. . . . x . . .	3.3
Coworkers encourage research	. . . .x . . .	3.9
Statistical services available	. . . . x . . .	3.4

Further analyses of data from this study are needed to determine if level of education, undergraduate research experiences, type of pre-service professional experience and service on a nutrition support team produce patterns of research activity that differ significantly from other group profiles.

SUMMARY AND CONCLUSIONS

All clinical dietitians, especially those on nutrition support teams, have been encouraged to participate in applied research studies. Results of this study indicate that, on the whole, dietitian members of ASPEN are extremely interested in research but only a small percentage engages in research activity as a regular part of clinical dietetic practice. If clinical dietitians are to assume new roles, gain recognition and maintain the level of excellence required for leadership in this rapidly changing professional environment, they must engage in applied research to validate the merits of current practice and to develop new hypotheses for future practice.

Dietitians may have research interests which are similar to, or very different from, other health professionals. As health care becomes more sophisticated, there is an increasing demand for applied research to validate methods and procedures used in everyday practice. Health professionals seem best suited to conduct studies related to their own fields. These professionals often express interest in doing research, yet many of the published articles in the respective professional journals and major presentations at national meetings are authored by physicians, educators and others outside the field. One may ask whether health professionals actually engage in applied research studies, publish or present their work in other settings, possess the necessary skills, and work in an environment where research is encouraged and supported.

The survey instrument used in this study could easily be adapted for use by any allied health group. Studies could be designed to identify differences between health professions, ascertain specific needs of faculty members or clinical practitioners, or identify research involvement of practitioners and educators in different types of settings.

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PART II

RESEARCH RELATED TO EDUCATION OF ALLIED HEALTH PROFESSIONALS

In the second part of the Symposium, four research papers were presented addressing different dimensions of allied health education:

Interprofessional Education and Attitude Change

Professional Team Building

Role Modeling Healthy Lifestyles

Continuing Education Needs

INTERPROFESSIONAL EDUCATION AND ATTITUDE CHANGE: RESEARCH DESIGN AND THE COLLABORATIVE PROCESS

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ABSTRACT

This paper describes a two year research project to assess attitude changes among students engaged in interprofessional education. Attitudes toward interprofessional collaboration are the focus of the study.

INTRODUCTION

For almost half a century social psychologists have studied the nature of attitudes, have developed theoretical models to describe and measure attitudes, and have examined the relationship between the attitudes people hold and their behavior. In his discussion of research on attitude formation, White presents two views of the concept of personhood that have accounted for alternative theoretical models found in the study of attitudes. In the one view, persons are seen as objects reacting to forces or inputs which result in responses, attitudes, or outputs. The individual is a "reactive, measurable, and limited organism" (White, p. 18). The other view sharply contrasts humanity "as selective, organismic, and developmental" (p. 19). This historic battle over the nature of humanity and the system of expression of that nature provides the backdrop for attitude research even today. The view of humanity embedded in the assumptions of the Commission on Interprofessional Education and Practice align more consistently with the second view of people as holistic and open beings. The concepts of attitude within that framework provide the theoretic basis presumed in the study of attitudes presented in this discussion.

ATTITUDES AND ATTITUDINAL CHANGE

Most, if not all, operational definitions of the construct, attitude, in social psychology research require additional qualifiers to clearly present the facts of attitude research, and more importantly, the reality of the complex phenomena under investigation in attitude research (White, p. 19). Recognizing the research problems inherent in the logical inquiry of attitudes, White suggests a cautionary note to attitude researchers: "...any attitude defined as a specific answer to a specific question must be viewed at best as the top of the iceberg of a dynamic and reconfigurating system of a total individual" (p. 20).

For the purposes of this discussion we will use White's definition of attitude which acknowledges a dynamic view of humanity: "An attitude is the externalized 'choice' reflecting an individual's predisposition to actively select and organize his experience in relatively continuous and predictable ways. These predispositions are products of biological, personal and cultural forces working toward an identity system capable of determining affirmative behavior" (White, p. 20).

Inherent in this holistic definition of attitude is the recognition of an individual's capacity to select and organize experience into predictable choices. Attitude change, then, represents more than random or ad hoc response to an issue, but instead reflects a new predisposition in the emergent restructuring of one's experience. Within this definition, attitude researchers acknowledge the individual's capability of change or growth as it is influenced by his or her life context. Therefore, attitudes found among students in interprofessional education are to be understood in part by the student's level of personal professional development.

In order for attitude change to occur, persons must be immersed in total contexts drawing from these experiences in their own ways. The total context for attitude changes about interprofessional relationships should, therefore, require the opportunity for experiences in interprofessional activity. Interprofessional reflection and validation of autonomy could then occur which would allow individuals to make their own meaning from the experience. Making meaning from one's experiences parallels John Dewey's idea of the reflective experience. The possibility of restructuring human experience gives theoretic foundation for the particular content and strategies used in the interprofessional courses included in this discussion of attitude research.

GROUP BEHAVIOR AND ATTITUDE CHANGE

Attitude researchers acknowledge that social norms are an influential factor in the study of attitudes and attitudinal change. Normative consensus and normative support play a significant role in attitude formation and attitude change. Study of the group in interprofessional education and practice will enhance our understanding of the total context in which one experiences attitudinal change. In order to examine social norms within the total context in which attitudes are studied, researchers turn to field theory and group behavior, in particular, to examine the influence of the social context on individual and group behavior. Analysis of observed complexities of group structure, function and the nature of group interactions can further enhance our understanding of attitudes and attitude change.

RESEARCH OF THE INTERPROFESSIONAL GROUP AND CHANGES IN ATTITUDES

Interprofessional education and practice groups have received little attention in research in group theory and practice. In addition, the small numbers of studies devoted to interdisciplinary teams have yielded tenuous results. In a recent study of the interdisciplinary group, McCorcle suggested that interdisciplinary task teams differ in two important ways from the kinds of groups most often studied, (McCorcle, 1982). First, the interdisciplinary task group is an open rather than a closed system owing its existence to some agent outside the group's boundaries. This outside agent places unpredictable requirements on the group. Therefore, the group will be expected to engage in various activities to respond to the interactions within this larger environment. Second, production schedules and commitments to outside agents emphasize the time boundaries of the group. The behavior of the interprofessional groups will be influenced by an emphasis on task requirements. These two differences impose necessary requirements for both the development and the study of interdisciplinary groups. Interdisciplinary groups must be interested in and manage group boundaries. They must also attend to the needs of group members and maintain a level of solidarity. These two characteristics, openness of the group's boundaries and the needs of the group to attend to task requirements, present a dilemma for the interdisciplinary group. Bales refers to this dilemma as strain toward integration (solidarity) and strain toward adaptation (interaction within the environment) (McCorcle, p. 294). McCorcle studied an interdisciplinary group in a university setting and found that these two distinctions were, in fact, useful to study and measure the nature of group process and the participation of group members (McCorcle, 1982).

Through the study of group behavior, and particularly the behavior of interprofessional groups, we have a foundation for examining the social context in which attitudes are formed and changed. Results of the study of the phenomenological ground of attitude formation and change in groups provide direction for our work in interprofessional education and practice.

SOURCES OF CONTENT IN INTERPROFESSIONAL EDUCATION

We have briefly discussed the student and the educational context for the study of attitudes. We turn next to a discussion of the content inherent in interprofessional education and practice.

The content of interprofessional education is derived in part from three assumptions posited by the Commission on Interprofessional Education and Practice at The Ohio State University:

> Human wholeness, the integration of mind, body, and spirit, exercised in constructive relationships and productive functioning, is the inherent goal of personal growth and development. Each individual is a person of intrinsic value endowed with natural dignity and the right of autonomous choice.

This assumption generates the idea that practitioners' personal, professional and interprofessional roles derive from human wholeness and can be known in their relationships with others as they work together toward effective client care. Further, this assumption emphasizes the value of the individual and the acknowledgement of a natural tension between the freedom of the individual and responsibility to group goals.

Interprofessional education and practice presuppose the following attributes:

a) sensitivity to the advantage of comprehensive service over the fragmentation of services;
b) readiness to open one's mind to the perspectives of other professions;
in the attempt to achieve a more complete understanding;
c) engagement in the cooperative delivery of services;
d) influence in the formation of public policy through the shared study and action of professionals and/or professional association.

This assumption encourages the professional to value the contributions of other disciplinary perspectives as a prerequisite to effective client care. It also encourages open-mindedness as a personal attribute for collaborative participation and cooperative service in client care.

> Clients are human beings before they are cases. Professionals, in like manner, are human beings before they are practitioners. The welfare of the whole person in both diagnosis and the delivery of services is enhanced by interprofessional practice. The development of professional practitioners as human beings is nurtured by interprofessional collaboration. It is important both for persons coming for help and for those who provide it to experience their relationship as humanizing. Interprofessional education and practice enhances the humanity of professionals and, as a result, the humanity of those who turn to them for help by increasing on the one hand their competence and, on the other, their compassion.

This assumption emphasizes that the constructive relationships mentioned in the two previous assumptions are valued and critiqued through our human experiences. The ultimate evaluation of the collaborative process and the provision of care is qualitative. It is characterized by qualities of human compassion. Therefore, the content of interprofessional education includes examination of constructive personal, professional and interprofessional relationships. It also includes examination of each professional's perspective in providing client care and examination of the requirements for collaboration experienced in the interprofessional group. The educational aim of the interprofessional curriculum at The Ohio State University is to teach interprofessional collaboration for effective client care and the exploration of complex problems.

SETTINGS FOR ATTITUDE RESEARCH

Research in attitude change has been conducted since 1983 in each of four courses offered by the Commission on Interprofessional Education and Practice at The Ohio State University. These courses include the Seminar on Interprofessional Care (two sections), Ethical Issues Common to the Helping Professions, Interprofessional Seminar in Clinical Practice, and Changing Societal Values and the Professions. Each class includes graduate students and faculty representing six academic units at The Ohio State University (the School of Allied Medical Professions and the Colleges of Medicine, Nursing, Education, Social Work and Law) and the Columbus Cluster of Theological Schools (comprised of Methodist Theological School, Trinity Lutheran Seminary and Pontifical College Josephinum). Some graduate students in the program are also practicing professionals and other professionals enroll on a continuing education basis.

Faculty provide readings, lecture and discussion of content, as well as leading their respective professional groups. Each faculty member also leads an interprofessional group of approximately twelve students. Lectures and discussions include topics and case presentations relevant to the subject matter of each course. Cases and topics are then reviewed and analyzed in both professional and interprofessional small groups. Results of group discussions are generally reported in plenary sessions. Additionally, the clinical practicum seminar includes a substantial amount of time observing functioning interprofessional teams and their clients. Students are evaluated on the basis of class participation, written assignments, and in some cases, field assignments.

METHOD

Instrument

A forty item paper and pencil questionnaire designed to gather demographic and attitudinal data from students included thirty-five semantic differential statements constructed around five central themes:

1. Attitudes about the value of the seven human service professions represented by the students;
2. Attitudes about the role of conflict in the interprofessional collaborative process;
3. Attitudes about the structuring of interprofessional group organization;
4. Attitudes about the nature and distinctiveness of one's role as a participant in the interprofessional collaborative process;
5. Attitudes about one's willingness to participate in the interprofessional collaborative process.

Students responded to a five point scale of degree of agreement or disagreement with each statement. Two additional sentence-stem items elicited information regarding professional and interprofessional goals, and three additional items solicited demographic data.

Students were asked to complete the same questionnaire both at the first and the last meetings of each course. Researchers are computer analyzing data according to professional group, pre- and post-assessment, and by year of enrollment. Researchers are employing SPSSx (Statistical Package for the Social Sciences, revised edition) to derive all pertinent descriptive statistics, t-scores and Pearson Correlations from the 35 semantic differential items in addition to five combination variables. Researchers obtained the combination variables by grouping 33 semantic differential items around the 5 central themes of the study:

1. VALU identifies attitudes about the value of including representatives for each of the 7 professions in the interprofessional collaborative process;
2. CONF identifies attitudes about the role of conflict in the interprofessional collaborative process;
3. EQAL identifies attitudes about the egalitarian versus hierarchical organization of the interprofessional collaborative process;
4. ROLE identifies attitudes about the nature and distinctiveness of one's professional role in the interprofessional collaborative process;
5. PART identifies attitudes about one's willingness to participate in the interprofessional collaborative process.

Researchers are using SPSSx to obtain a multi-variate analysis of variance of these five combination variables.

Subjects

Course participants included degree students and professional practitioners. Of these participants, the subjects of the study are those persons who voluntarily completed either/both the pre- or post-assessment instruments. Subjects are not being paired according to group or year, but are being paired according to course.

PRELIMINARY RESULTS AND DISCUSSION

While analysis is not yet complete, it is clear that the study will yield several types of data. Descriptive data are valuable in developing a profile of students interested enough in interprofessional collaboration to elect one of the courses. Additionally, descriptive data may be analyzed and compared between professional groups. Such a comparison may reveal factors distinctive to one or more professions which encourage or discourage participation in interprofessional collaboration.

Preliminary results suggest that students engaged in interprofessional education courses clearly place a high value on other professions. They are inclined to value an egalitarian structure in settings for interprofessional collaboration. Correspondingly, they tend to place a high value on their own participation in interprofessional discussions.

In addition to descriptive data, the study is yielding data about attitude changes occurring during the courses. Attitude changes will be analyzed by course and by profession. Changes judged significant may identify aspects of a course curriculum and/or process that should be developed or modified, depending on the goals of the course. Changes may also be used to clarify course objectives and identify teaching strategies. Faculties from one course may find it useful to review the results from the other courses to explore distinctions and modifications in curriculum.

Preliminary results suggest that students develop a more positive attitude toward the role of conflict in the interprofessional collaborative process. Additionally, there is some suggestion that their attitudes about the value of some specific professions changed in some of the courses. There is also an indication that during some of the courses they modified their perception of their profession's role in the interprofessional collaborative process.

Responses to the sentence-stem items suggest that at the pre-assessment students expressed a great interest in serving the immediate needs of their clients. By contrast at the post-assessment they expressed a greater interest in utilizing a committed holistic approach focusing upon their client's total self identity, self-expression and potential.

Demographic data indicate a wide age distribution with a mean in the mid-to late-thirties. The students are predominantly female. They represent cross sections of the seven professions with social work and theology contributing the most students and medicine contributing the fewest.

RESEARCH DIRECTIONS

While the results are by definition preliminary, they are suggestive of future research needs in student attitude changes. Perhaps the most obvious need is to develop a means of assessing similar attitudes among a control group. In one model for providing control group data, faculty in carefully matched courses would need to be willing to facilitate the pre- and post-assessment process and encourage students to cooperate.

Variables in future attitude research also need to be more precisely identified, isolated and related to specific course activities and teaching strategies. This will necessitate further cooperation by both students and faculty.

Attitude research needs to be developed more specifically in relation to particular courses, content areas, and teaching methods as well as other groups engaged in the interprofessional collaborative process. For example, in the area of ethical decision-making, is attitude change facilitated by the interprofessional collaborative process and in what respect? Such research might contribute to the development of a phenomenology of interprofessional ethical decision-making. A further research area might explore how such a phenomenology developed in the classroom would be different from that developed in an interprofessional clinical setting. Finally, researchers may find it fruitful to explore the relationship between the development of positive attitudes toward interprofessional collaboration and interprofessional practice.

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PROFESSIONAL TEAM BUILDING AS A CURRICULAR EXPERIENCE

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ABSTRACT

Allied health professionals are expected to communicate with each other in their professional settings; however, little, if any, opportunity is given during their undergraduate academic preparation to experience interdisciplinary communication involving "real world" tasks.

The authors, one a speech language pathologist (SLP) and the other a medical record administrator (MRA), both teaching undergraduate courses, designed a simulated classroom project in which both classes would collaborate in the design and content of a portion of the Medical Record. The MRA students would be responsible for the format and design of three parts of the folder (Face Sheet, Consent Form and Case History Form) and the speech language students would develop the content for these forms.

A pre-post test design questionnaire was developed and administered to the students which covered eighteen specific evaluating questions in addition to soliciting comments.

Findings revealed important differences between groups which might be a function of lack of interdisciplinary emphasis in teaching in professional areas (i.e. lack of understanding the role of other professions). Students were generally supportive of collaborative effort and felt it added a dimension of reality to the courses. The instructors were intrigued with the problems and differences identified by the data (i.e. problems in communication, role awareness and attitudes) and significant changes in some students as a function of preparation. A revised pedagogical design will include better preparation of students for team collaboration and more time for interdisciplinary experiences.

INTRODUCTION

In the health care setting, it is frequently necessary for members of the allied health professions to interact in numerous ways in order to provide for the needs of the patient or client. In fact, little that we do within our own professional sphere is done without having been affected, whether directly or indirectly, by those in other professional areas of expertise.

The practice of having, within one institution of higher education, several preparatory programs in various health care fields, provides an ideal setting for introducing the concept of interdisciplinary professional conduct. In many such institutions, students majoring in one professional discipline have only infrequent contact with students in other disciplines, perhaps sharing classes at an introductory level (biology or writing, for example). There is often little deliberate opportunity made for students to work together in such a way that gives them practice in the frequent team effort required in the field. This concern motivated the researchers to attempt an interdisciplinary study.

PURPOSE

The purpose of the study was to investigate the question, "Can undergraduates from two different professions work together on a "real world" task and at the same time improve their ability to communicate with and better understand each other's discipline?"

The task was to collaborate on the creation of three specialized forms for inclusion in the medical record of a theoretical patient. Speech pathology students were responsible for the content of the forms and medical record administration students were to design the forms.

DESIGN OF THE STUDY

Our pedagogic approach was simple. We agreed to spend one class period presenting the task which was then followed up with a printed description of the requirements and responsibilities for the students. The major intervention was the interaction between the students with regard to the task.

While the choice of the two disciplines involved was governed by the professional orientations of the two researchers and the fortuitous chance of existing within the same school of allied health professional preparation, there are several characteristics within those professions which make them interesting subjects for the study.

Speech/Language Pathology (SLP), is a clinical profession, concerned with the diagnosis and treatment of disorders of speech and language. Medical Record Administration (MRA), is a non-clinical, administrative profession concerned with the management of health information systems. While both have a strong science base, the SLP curriculum concentrates on the treatment of patients (the program requires more courses in psychology, for example), while the MRA program concentrates on the management of employees and systems. The speech/language pathologist is concerned with the diagnosis and treatment of disorders found in individuals, while the medical record administrator is concerned with the design and implementation of systems which affect groups, rather than individuals. These differences in orientation were believed to provide a better basis for comparison than if the disciplines involved were more similarly oriented, for example, if SLP were paired with the Physical Therapy program or if MRA were paired with the Administration of Health Services program, both of which are also offered by the school.

The task for the student was developed from one used in the course "Diagnosis and Appraisal" in the SLP curriculum. The completed project included sociological information, a case history, report of evaluation and diagnosis. The project was evaluated for a letter-grade.

The MRA students were given minimal guidance on the content of these forms, since part of their responsibility was to work with the SLP student assigned to them in order to discover from that student the requirements for documentation. In this way, the researchers attempted to mimic a real situation wherein a medical record administrator, in providing consultation on the design of forms, needs to question the clinician on the desired information to be contained on the form. The MRA student was to design the consent forms for treatment and the release of information based on what references they could find, and on their own knowledge of the legal ramifications of these documents, again in an attempt to reproduce a real-world situation.

Some important differences existed between the students in terms of their preparation. The SLP students were juniors without practicum experience. The MRA students, members of a course in Health Information Management, were seniors and had had two clinical experiences in both acute and alternate care facilities. Another major difference was that the MRA students had taken a course entitled, "Introduction to the Health Professions", which was designed to introduce students to the various health professions including speech language pathology. The SLP students generally did not take this course.

The intitial presentation was made jointly by the instructors and was received with few questions from the students. It wasn't until after the students met for the first time in pairs that we began to get feedback that all was not well with the students. As instructors we began to get excited because the problems the students were reporting were similar to those they would encounter in practice. We felt even the experience of not being able to communicate with someone can be made into a positive learning experience. For example, one of our top academic students complained that she never could meet with her partner and when they did meet, interpersonal friction developed. Complaints were also focused on the presentation by the instructors so that it was necessary to spend additional time and even re-write the initial task for purposes of clarification. Another broad area of complaints had to do with the students' perceptions of each other. One group said that the other didn't know much about the other's profession. In the end, the task was successfully completed by all students and the post-test was administered.

ANALYSIS OF DATA

A 20 item questionnaire was administered in a pre-post test design to both groups of students (Appendix E). Item 20 was an open-ended request for comments which allowed for subjective responses. Nineteen items were questions which required a selection along a 5 point scale ranging from "Agree Entirely" to "Disagree Entirely". Optimal answers were determined "a priori" by the authors and served as the relative basis for meaningful statistical interpretation. The questions fell into five general categories having to do with the students' understanding of the project and each other's profession, feeling of confidence or lack thereof, ability to communicate, educational value of the project and evaluation of the logistics of the presentation. Each questionnaire had mean scores computed for the 19 items and group means were compared with a pre-post test design. Multiple t-tests for independent measures were used to examine the effect of the variables Group (MRA vs SLP) and condition (Pre vs Post experience) on mean rating on the 19 item questionnaire. Means were based on average rating scores across all 19 items for both the MRA and SLP groups.

RESULTS

Figure 1 is a histogram which displays the mean Pre and Post experience rating scores for the two groups. It can be observed thus, as a group the MRA students exhibited very little change in mean rating scores before and after the experience. Mean Pre and Post ratings were 3.39 and 3.40 respectively. The difference between scores was statistically nonsignificant (t = .379, df = 25). Mean Pre and Post ratings of the SLP students were 3.24 and 3.42 respectively. The difference between the scores was statistically significant at the .001 level (t = 5.01, df = 24, p .001).

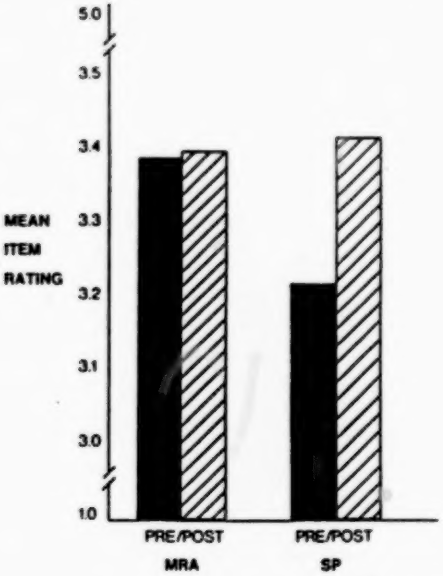

Fig.1 Mean Pre/Post Expanded Item Ratings for Medical Record Administration and Speech Pathology Students

Figure 2 graphically displays the relationship between the MRA and SLP groups before and after the class experience. It is interesting to note at the beginning of the experience the MRA group exhibited mean ratings which were higher than those of the SLP students. The difference of .15 between the groups was statistically significant at the .001 level. Group differences were not observed at the end of the experience with the SLP students exhibiting mean scores comparable to those of the MRA students. The post experience scores between the two groups of .02 was statistically non-significant.

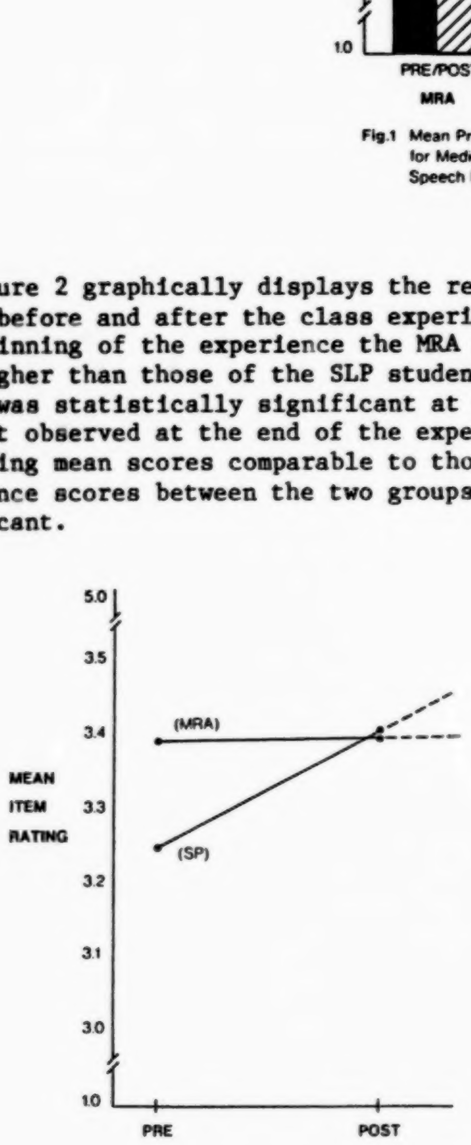

Fig. 2 Mean Pre/Post Scores Extrapolated for Medical Record Administration and Speech Pathology Students

INDIVIDUAL COMMENTS

The comments part of the questionnaire proved most rich in the variety of personal reactions to the assignment. In the pre-test, only the MRA students made comments, whereas, in the post-test, both groups generated responses. The comments of MRA students in the pre-test seemed to center on difficulties in communicating with the other profession. Typical of their responses were the following:

> I feel that this assignment is valuable because it deals with what I imagine is a "real world" situation. The struggle of working with a person in a different discipline has been a very interesting change from the traditional assignments. The only problem I see with such an assignment is how it is hinged on the knowledge of both parties, i.e. the speech pathology students do not have a great deal of experience with medical records....

On the post-test, comments such as the following emerged:

> My experience with this project was a pleasant one. My partner and I worked well together. It was a very good experience whether a satisfying one (as mine) or not. In our professional lives we will be dealing with those of other professions on a daily basis and need experience in how to work effectively, even though we may not agree or totally understand the other profession. Our meetings were productive. She was very cooperative about changes I had to make in case history 1st draft. But in return, I gave her an explanation of the changes so she would understand why they were necessary. I was very satisfied with the end product. The secret is being a good communicator and being flexible as far as possible. If disagreements arise, handle them in a professional manner and respect the others' right to their opinions.

SUMMARY

This interdisciplinary classroom study suggests that groups of students differing from each other in professional preparation can, by working together on a common project, achieve a greater similarity of response as reflected by mean scores on a pre-post questionnaire. The researchers are enthusiastic and sufficiently encouraged to administer the same project with modifications to include providing more clarification of requirements and additional class time to facilitate meetings among students.

ROLE-MODELING HEALTH PROMOTION AND DISEASE PREVENTION FOR MEDICAL LABORATORY PERSONNEL: A PILOT PROGRAM

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ABSTRACT

Medical laboratory professionals have for many years provided technical data upon which other health professionals and their clients have relied. In fact, medical laboratory professionals may well have been the forerunners of preventive and diagnostic efforts in Allied Health, since they have participated in secondary and tertiary prevention efforts since at least the turn of the century. They have, however, been hardpressed to involve themselves in health promotion and disease prevention in more overt roles. The purpose of the project was to convert medical laboratory professionals at Windham Hospital into role-models for health promotion and disease prevention. The project was developed by the author with input from staff members representing a diversity of professions at both institutions. This was accomplished by having the participants complete a life management questionnaire, be tested for body weight and body fat content, blood pressure, and blood lipids as baseline measurements. Participants then set their own health improvement goals. Over the course of one year they participated in 12 two-hour sessions by experts in the areas of behavior modification, stress management, nutrition and diet, exercise and fitness, smoking cessation and lipid chemistry. Experts in these areas were recruited from both the hospital and the School of Allied Health Professions. Blood pressure and body weight were charted monthly, while the other measurable parameters were repeated at 6 and 12 months. Using correlations and ANOVA, any significant change from baseline measured the success of the program. Data analysis was performed cooperatively by the presenter and the HP/DP project evaluator. Each participant was also expected to share their experience with at least one other person or group. The approach used in the design, implementation and evaluation of this project successfully drew upon and integrated the skills and knowledge of a diverse group of professionals from a hospital and an academic setting.

INTRODUCTION

Just when health became a national focus may be hard to pinpoint, but the illnesses that plagued such national figures as Dwight D. Eisenhower, John F. Kennedy, and Lyndon B. Johnson certainly cannot be overlooked. Nor can the successful treatment afforded these men be overlooked. Cardiologist Paul Dudley White, who believed firmly in early ambulation and exercise in the rehabilitation of cardiac patients, is probably most responsible for President Eisenhower's full and complete recovery from his 1956 heart attack (Lukash, 1984). Senate Majority Leader Lyndon B. Johnson, later to become President, suffered a massive coronary thrombosis in 1955. He, too, was fortunate enough to have made a complete recovery. Johnson subsequently quit smoking, reduced his consumption of fats, lost thirty pounds, instituted an afternoon nap for rest and relaxation, and began a program of daily swimming for fitness. John F. Kennedy's keen personal interest and participation in sports may have prevented him from having a heart attack, even though he did suffer with chronic back ailments. His daily physical therapy treatments and attraction to healthy life style activities surely were instrumental in his strong support for a national fitness program for the nation's school children.

Health *is* a national focus and responsible people are responding. Five national goals (Table I) and fifteen priority areas of concern (Table II) affecting the status of the nation's health have been identified. These concerns were outlined in two DHHS publications as Objectives for the Nation and Five Health Goals (Healthy People, 1979; Objectives for the Nation, 1980). As a result, 1990 has become a target date by which significant improvement in this nation's health is to be realized. In order to meet this governmental mandated deadline, *every effort* by *everybody* must be made.

TABLE I Five national health goals*

1. To continue to improve infant health, and, by 1990, to reduce infant mortality by at least 35% to fewer than nine deaths per 1,000 live births.
2. To improve child health, foster optimal childhood development, and, by 1990, reduce deaths among children ages one to 14 years by at least 20%, to fewer than 34 per 100,000.
3. To improve the health and health habits of adolescents and young adults, and, by 1990, to reduce deaths among people ages 15 to 24 by at least 20%, to fewer than 93 per 100,000.
4. To improve the health of adults, and, by 1990, to reduce deaths among people ages 25 to 64 by at least 25%, to fewer than 400 per 100,000.
5. To improve the health and quality of life for older adults, and, by 1990, to reduce the average annual number of days of restricted activity due to acute and chronic conditions by 20%, to fewer than 30 days per year for people aged 65 and older.

TABLE II Health "Objectives for the Nation": 15 priority areas of concern*

Preventive Health Services
    High blood pressure control
    Family planning
    Pregnancy and infant health
    Immunization
    Sexually transmitted diseases
Health Protection
    Toxic agent control
    Occupational safety and health
    Accident prevention and injury control
    Fluoridation and dental health
    Surveillance and control of infectious diseases
Health Promotion
    Smoking and health
    Misuse of alcohol and drugs
    Nutrition
    Physical fitness and exercise
    Control of stress and violent behavior

Table III
Cardiovascular Risk Profile

Characteristic	Risk Profile	Risk
Age (years)	> 65	++
	45-65	+
	< 45	-
Sex	Male	++
	Female	-
Family History	MI< 55	+++
	MI< 65	+
	CVD < 65	+
	absent	-
Cholesterol level (mg %)	> 270	+++
	240-269	++
	221-239	+
	< 220	-
Triglyceride level (mg %)	> 200	++
	151-199	+
	< 150	-
Blood pressure (mm Hg)	> 160 (systolic) and/or > 100 (diastolic)	+++
	140-159 (systolic) and/or 90-99 (diastolic)	++/+
	100-139 (systolic) and/or 69-89 (diastolic)	-
Smoking	> one pack per day	+++
	< one pack per day	++
	Stopped at least 5 years	+
	Nonsmoker	-
Behavior pattern	Type A (symptomatic)	+++
	Type A (asymptomatic)	+
	Type B (asymptomatic)	-
Exercise	None or some; irregular	+
	Regular aerobic exercise	-
Obesity	Severe	++
	Moderate	+
	Mild	-

+++ = severe; ++ = moderate; + = mild; - = not significant

Assessment Strategies in Behavioral Medicine.
FJ Keefe and JA Blumenthal (eds.)
New York: Grune & Stratton, 1982

Through the cooperation efforts of the School of Allied Health Professions at the University of Connecticut, a pilot program was launched at Windham Community Memorial Hospital (WCMH) involving medical laboratory professionals. The parameters involved in this project are also considered risk factors for (Table III) coronary heart disease (CHD); reductions in smoking, heart attacks, and strokes; better control of hypertension, stress and weight; and improved nutrition, fitness, and exercise habits (Keefe and Blumenthol, 1982).

MEDICAL LABORATORY PROFESSIONALS INVOLVEMENT

One is hard pressed to find reference to the role medical laboratory professionals may have played in the diagnosis and treatment of these presidents. It must be assumed, however, that the technical data provided by laboratory professionals, which other health professionals and their clients have long relied upon, were in great demand.

Medical laboratory professionals have not been traditionally considered health promoters and disease preventers. In point of fact, they may well have been the forerunners of preventive and diagnostic efforts in allied health, since they have been participating in secondary and tertiary prevention efforts since at least the turn of the century (Price, 1984). It is not surprising though, to find no reference to their role in highly visible cases since medical laboratory professionals have traditionally been the "silent partners" in health care (McTernan and Lehmann, 1984). The new strategy this pilot program offers medical laboratory professionals is the opportunity to convert to an overt "speaking role" as health promoters and disease preventers by role-modeling. Utilizing an immense specialized body of knowledge and the present skill of generating technical data, the natural progression by medical laboratory professionals to equal partnership in health promotion and disease prevention awaits only a model.

GOALS AND OBJECTIVES OF THE PROJECT

The goal of this pilot project was to prepare role-models for health promotion and disease prevention. Through participation in a planned program, laboratory professionals could improve their health and their health promotion activity. The pilot program, if successful, could be later expanded to other hospital employees and the community at large.

Three objectives of the program were identified:

Objective one was to establish an Advisory Health Network Team for health promotion and disease prevention at Windham Community Memorial Hospital.

Objective two was to demonstrate that laboratory health professionals could modify behavior that resulted in improved health and improved health promotion activity.

Objective three was to prepare individuals who could share their own health program experiences with others in at least one formal or informal session at the conclusion of the program.

In order to achieve this goal and these objectives, medical laboratory professionals at Windham Community Memorial Hospital were asked to voluntarily participate in a planned program for one year. This paper reports results after eleven months into the project.

METHODOLOGY

Several approaches were used to accomplish the stated objectives of the pilot program.

1. Objective one was to be achieved by personal solicitation of qualified and interested personnel who represented several areas of concerns within the hospital community.

2. Objective two was to be pursued by volunteers within the medical laboratory. An arbitrary number of 25 was to be accepted. Baseline information was collected including:

    a. Administration of a questionnaire on personal health and life style to the participants prior to conducting any formal sessions. The instrument was from Blue Cross/Blue Shield Guide to Staying Well (Blue Cross, 1983) (Appendix B). This test was adopted from a risk analysis developed by Howard F. Hunt, Ph.D. and James R. White, Ph.D. at the University of California, San Diego. This questionnaire was chosen because it focused on the target areas cf concern to the pilot program. The instrument will again be administered at the conclusion of the 12-month program.

    b. The collection of baseline blood studies was for a lipid profile, which included cholesterol, HDL & LDL cholesterol, triglycerides and HDL cholesterol %. An ABD (automated blood count) was also run on each volunteer. A total body fat analysis was done along with total body weight and blood pressure. Blood tests and body fat analysis will be repreated at the conclusion of the study. Body weight and blood pressures were monitored monthly. Particpants were advised that they should consult a physician prior to participation in any weight loss or exercise program. A copy of the consent form used is given in Appendix F.

    c. Participants were then encouraged to set their own goals and become faithful participants of the program. Any improvement in their health while participating in this program would be considered a measure of the success of the program.

3. Objective three would be achieved by presenting the participants with lectures, literature, and other tools to facilitate their presentation to others. The concept of "each one teach one" of course is not new, but a tried and true method. A list of classes is given in Appendix G.

RESULTS

In response to personal solicitations to establish an Advisory Health Team Network, no individual asked refused. As a result the Network consisted of a medical technologist, the Project Director, a pathologist, a cardiac treatment center nurse who has been instrumental in monitoring the monthly blood pressure and body weight analyses, a patient education nurse, and an employee health nurse. In addition, a physician specializing in internal medicine, two nutritionists, two physical therapists, a director of community relations, and an associate administrator of the hospital (Table IV). With but a few exceptions, all have played vital roles in the program.

Table IV
Advisory Health Team Network

Medical Technologist - Project Director
Pathologist
Cardiac Treatment Nurse
Patient Education Nurse
Employee Health Nurse
Internist
Nutritionists (2)
Physical Therapists (2)
Director of Community Relations
Associate Hospital Administrator

As can be seen in Table V, the population for this pilot program consisted of eight males (2 from the Laboratory) with a mean age of 41, and eighteen females with a mean age of 40. The ages for males ranged from 32-58 while the females ranged from age 22-59.

Table V
Subjects
N = 26

	Male	Female
Sex	8	18
Age		
Mean	41	40.2
Range	32-58	22-59

Table VI contains a summary of data collected during pretest. All the lipid parameters show the females to have higher results than the males with greater ranges in each category. Note, however, that the higher cholesterols and triglycerides may be off-set by the higher HDL cholesterol in the females. The normal values vary slightly for these parameters depending on age and sex. One rule of thumb for correlating cholesterol levels with age, for example, is to add age to 180. With but two exceptions, the participants fell within acceptable ranges for cholesterol. There were three unexplained low values for triglycerides and one high result, one HDL % was in the danger zone and one in the high risk category. There were two participants with HDL in the 90's and one reached 100! Four individuals had initial systolic blood pressures of 140, including two who had initial diastolic pressures of greater than 90. As can be viewed in Table VII, the average systolic pressure dropped from 114 to 108, while the average diastolic pressure dropped from 71 to 63.

Table VI
Pretest Results

	Males	Normals	Females	Normals
Cholesterol Range (117-263)	167	(140-300)	197 (150-292)	(140-300)
HDL Cholesterol Range (34-61)	46	(32-72)	67 (42-100)	(39-96)
Triglycerides Range (41-190)	80	(50-200)	87 (29-239)	(50-200)
LDL Cholesterol Range (81-191)	106	(60-185)	110 (54-198)	(60-185)
HDL Cholesterol % Range (13-41)	29		31 (16-49)	
Dangerous		< 7		< 12
High		7-15		12-18
Average		15-25		18-27
Below Average		25-37		27-40
Protection Probable		> 37		> 40
% Body Fat Range	22.57 (7.9-48)		24.9 (14.1-35.67)	

Table VII
Blood Pressures and Weight

	Initial Wt.1	Latest Wt.2	Initial BP 1	Latest BP 2
Ave.	153 lbs	149 lbs	114/71	108/63

(3 had losses greater than 10 lbs)

With regard to weight, the average initial weight was 153 pounds, while the latest (September 17, 1985) was 149 pounds. This 4 pound net loss includes three individuals who lost in excess of ten pounds each.

Three individuals have stopped smoking since the program began, and three have reported a feeling of better stress reduction.

SPIN-OFFS OF THE PROGRAM

(a) Dietitians ran two 8 week weight loss clinics at the hospital for interested hospital and community members who paid.
(b) One participant has 15 people she now advises on eating right (diet) and exercise. She uses "Lean Cuisines" in her meal plan.
(c) The hospital is presently surveying some employees and community industries to determine the level of interest in a "for profit health promotion program."
(d) Employee health nurse is now screening all employees.

(e) Food in the cafeteria provides a more healthful choice and calorie count.
(f) An employee aerobic exercise class was established.
(g) Fresh fruit and granola mix has replaced danish, cakes and cookies at all lab in-services and other hospital meetings.
(h) The hospital has created a hospital wide health promotion team and is providing mini "grants" to employees who will organize and oversee some hospital fitness activity, i.e. a bowling team was reactivated, a baseball team was formed, several people, including three from the lab, competed in road races with the hospital paying for registration and transportation to the meet.

SUMMARY AND CONCLUSION

Medical laboratory professionals who may be forerunners of disease preventive efforts in allied health, have an opportunity to become equal partners in the health promotion and disease prevention arena. By completing the Life Management Test and having blood lipids, weight, body fat content, and blood pressure measured before and after participation in a planned series of lectures, consults, and seminars, medical laboratory professionals will have the opportunity to evaluate their progress toward achieving some personal health goals. With added knowledge and experience from the program, the participants will be encouraged, through role-modeling, to share the joy of better health with friends, family, and community. The success of this pilot program in some small but significant way will contribute to the success of meeting the 1990 Federal Government target date for improving the health of the nation.

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PERCEIVED CONTINUING EDUCATION NEEDS OF ALLIED HEALTH DEPARTMENT HEADS

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ABSTRACT

This article describes a survey of the continuing education needs of allied health department heads in Ohio hospitals and educational institutions for the following professions: Dietetics, Medical Record Administration, Medical Technology, Occupational Therapy, Physical Therapy, Radiologic Technology, and Respiratory Therapy. Seven hundred eighty responses (51% response rate) representing the seven allied health professions were analyzed by profession and in total. Of the respondents, 99% stated an interest in attending continuing education programs. However, only 59% had inservice continuing education provided by their employing institution. Specific topics needed and program characteristics to maximize accessibility were identified for each profession.

INTRODUCTION

Continuing professional education is recognized as the principal means for dissemination of new knowledge (1). In this era of health care cost containment with increased demands for professional productivity, however, we can no longer afford to approach continuing education in a haphazard manner. To be effective, continuing professional education must be relevant to the specific needs of participants and planned to maximize accessibility by accommodating their travel, financial and scheduling constraints.

Employers, health care institutions, academic institutions and industry spend considerable time and resources providing continuing professional education, often without an adequate assessment of needs. This interdisciplinary survey was designed to investigate the following questions:

1) What are the demographics of allied health department heads?
2) What is the availability of inservice continuing education for allied health department heads?
3) What barriers deter participation?
4) What program characteristics (distance, fees, length, days, etc.) are desired?
5) What specific topics are most needed for continuing education?
6) What significant practice problems currently face allied health department heads?

This study expands upon previous continuing education needs assessments (4,7,8) by identifying perceived educational needs of allied health department heads and the problems they currently face in the delivery of health care services.

METHODOLOGY

The survey population included all department heads in Ohio hospitals and educational institutions for the following professions: Dietetics (RD), Medical Record Administration (MRA), Medical Technology (MT), Occupational Therapy (OT), Physical Therapy (PT), Radiologic Technology (RadT), and Respiratory Therapy (RespT). The Ohio hospital list was obtained from the Office of Continuing Education of the Ohio State University, School of Allied Medical Professions. The population frame for each professional group was adjusted using the American Hospital Association Guide to the Health Care Fields (2). Allied health educational programs for each profession were identified from the 1984 Allied Health Education Directory (3).

The survey instrument was a modification of that used by Broski and Upp (4). For the purpose of the questionnaire, continuing education was defined as organized learning experiences planned to meet professionally related objectives, but not granted academic credit from the provider institution or association. Question types included forced choice, data completion, rating scales and open response. Content validity was determined through review by a committee of representative allied health professionals and by the academic directors of the seven professions at the Ohio State University (OSU), School of Allied Medical Professions. The questionnaire was reviewed for ease of completion and data analysis by the OSU Polymetrics Laboratory and the Health Services Division of Computing Services.

The survey consisted of 1,522 questionnaires accompanied by a letter of introduction and a postage-free, business reply envelope mailed to the identified departments' "Director" in January 1985. Seven hundred ninety-four department heads responded (52%). Seven hundred eighty responses were complete and used in data analysis (51%). Data were coded and analyzed using the Statistical Analysis System (SAS) package. Responses to open-ended questions regarding clinical topics needed and problems currently faced in heading the department were reviewed and categorized by members of the respective professions.

RESULTS

Demographic

Survey response rates by profession appear in Table I. Response rates among professions ranged from 41% for radiologic technology to 63% for physical therapy, with an overall response rate of 51%.

TABLE I
SURVEY RESPONSE RATES BY PROFESSION

	No. of Respondents	% Response Rate Within Profession	% of Total Respondents
Dietetics	119	52	15
Med. Record Admin.	112	52	14
Medical Technology	141	45	18
Occupational Therapy	75	59	10
Physical Therapy	128	63	16
Radiologic Technology	107	41	14
Respiratory Therapy	98	45	13
Total	780	$\overline{x} =$ 51	100

Of the allied health department heads responding, 50% hold a baccalaureate as the highest degree in their health occupation (Table II). The 20% holding master's or doctorate degrees were primarily medical dietitians or medical technologists. The 30% percent holding less than a baccalaureate were primarily medical record administrators, radiologic technologists and respiratory therapists.

TABLE II
HIGHEST DEGREE IN HEALTH OCCUPATION OF ALLIED HEALTH DEPARTMENT HEADS BY PERCENT WITHIN PROFESSION AND TOTAL

	Ph.D.	Master's	Baccalaureate	Certificate	Associate	Other
Dietetics	5	31	60	2	0	2
Med. Record Admin.	1	3	43	19	21	14
Medical Technology	3	36	47	9	2	2
Occupational Therapy	0	12	88	0	0	0
Physical Therapy	1	16	56	27	0	2
Radiologic Technology	0	9	28	44	15	4
Respiratory Therapy	1	8	37	24	27	4
% of Total	2	18	50	18	9	4

Of the respondents, 91% were working in a hospital setting. The range of respondents employed by hospitals among professions was 81% for occupational therapy to 96% for medical record administration. The range of bed size of employing hospitals is presented in Table III by percent of respondents within profession and total. Six percent of the total respondents were working in educational institutions, with the range of 3% for occupational therapy to 11% for medical technology. The average years of experience for respondents was 14 years with a range of 8.6 years for occupational therapy to 19.9 years for medical technology.

TABLE III
BED SIZE OF EMPLOYING HOSPITAL BY PERCENT WITHIN PROFESSION AND TOTAL

	>1000	751-1000	501-750	251-500	101-250	51-100	<50
Dietetics	0	5	9	25	37	20	5
Med. Record Admin.	2	4	8	23	26	29	8
Medical Technology	2	7	12	29	28	18	5
Occupational Therapy	1	3	13	47	31	3	3
Physical Therapy	2	5	11	27	32	21	3
Radiologic Technology	3	5	9	30	31	16	6
Respiratory Therapy	0	5	9	35	26	21	4
% of Total	1	5	10	30	30	19	5

Program Characteristics

Of the allied health department heads, 99% stated an interest in taking continuing education in their professional disciplines. However, only 83% stated that continuing education programs/classes relevant to their needs were currently available to them. Inservice continuing education activities are provided for 59% of the respondents and required by 58% of their employing institutions. For dietetics and medical record administration, however, a significant number of department heads are required to participate in continuing education but it is not provided inservice (Table IV). About half of the employing institutions have a release-time policy and 92% provided financial assistance for department heads to participate in continuing education programs/classes. The average number of hours spent in inservice education in 1984 was 22 with a range of 15 hours for medical record administration to 29 hours for occupational therapy.

TABLE IV
INSERVICE CONTINUING EDUCATION ACTIVITIES BY PERCENT WITHIN PROFESSION

	CE Provided	CE Required	Had Release Time Policy	Financial Assistance Provided	Inservice Hours Completed 1984
Dietetics	43	61	56	87	16
Medical Record Admin.	38	56	36	96	15
Medical Technology	67	51	51	89	21
Occupational Therapy	66	56	65	95	29
Physical Therapy	62	64	67	95	26
Radiologic Technology	65	61	43	89	18
Respiratory Therapy	74	57	36	94	31
% of Total	59	58	51	92	22

Primary deterrents to participation in continuing education were programs being too far for travel and too expensive. Respondents were willing to travel an average of 95 miles for programs and expected to pay an average of $64 for a daily registration fee. The expected daily fees varied greatly among professions, ranging from $43/day for radiologic technology and respiratory therapy to $87/day for physical therapy (Table V).

TABLE V
PREFERRED PROGRAM CHARACTERISTICS

	Miles Could Travel	Expected Daily Fee
Dietetics	94	$61
Med. Record Admin.	87	80
Medical Technology	76	55
Occupational Therapy	119	74
Physical Therapy	137	87
Radiologic Technology	82	43
Respiratory Therapy	82	43
Average of Total	95	$64

Program length preferred by 64% of the department heads was one full day. Nine percent preferred one-half day and 23% (primarily physical and occupational therapists) preferred two-day programs. Preferred program days were Tuesday through Friday by all professions except occupational and physical therapists who preferred Friday and Saturday.

Program Topics

Allied health department heads were asked to rate on a scale of 1 (not needed) to 5 (greatly needed) the degree to which they need continuing education opportunities addressing each of thirty stated non-clinical topics. The topics were arranged in the following categories: 1) educational theory and techniques, 2) management skills, 3) communication skills, 4) health care system and, 5) medical ethics. Non-clinical topics most frequently requested and ranked as 3.2 or above by all professions are listed in order of request frequency in Table VI.

TABLE VI
NON-CLINICAL TOPICS MOST FREQUENTLY REQUESTED BY ALL PROFESSIONS

Computer applications
Marketing self/department
Personnel motivation
Legislation
DRG's
Quality control
Personnel management
Supervisory skills
Medicare/Medicaid
Financial management

Clinical skills or advances in each respective health discipline were written in by the respondents and then rated on degree needed using the same 1 to 5 scale. The six clinical topics most frequently requested by each profession are listed in order of perceived need in Table VII.

TABLE VII
SIX CLINICAL TOPICS MOST FREQUENTLY REQUESTED BY EACH PROFESSION

Dietetics
1. Update on clinical practice of nutrition
2. Nutrition support services
3. Nutritional assessment
4. Food/drug interactions
5. Cardiac rehabilitation
6. Critical care dietetics

Medical Technology
1. Drug monitoring/toxicology
2. Computer adaptation
3. Immunology update
4. Microbiology advancement
5. Hematology review
6. Lab instrumentation review

Medical Record Administration
1. ICD-9-CM principles and DRG implications
2. Medico-legal aspects
3. Managerial techniques
4. Quality assurance/utilization review
5. Computer applications in MR
6. Word processing

Occupational Therapy
1. Neurodevelopmental treatment
2. Advanced splinting
3. Hand rehabilitation
4. Inhibitory serial casting
5. Sensory integration
6. Geriatrics

Physical Therapy

1. Musculoskeletal mobilization
2. Neurodevelopmental treatment
3. Orthopedics
4. Advances in electrical stimulation
5. Neurologic rehabilitation
6. Sports medicine exams and ultrasound

Radiologic Technology

1. Nuclear magnetic resonance imaging
2. Digital imaging
3. Computer applications
4. Update in radiology
5. Quality control
6. Sequencing diagnostic imaging

Respiratory Therapy

1. Ventilation updates
2. Pulmonary rehabilitation
3. Transportation
4. Hemodynamic monitoring
5. Specialized pulmonary function testing
6. Echocardiography

To determine if topics rated as needed were practice-based, respondents were asked to briefly state a significant problem (or problems) currently faced in heading their departments. The problems identified were very similar among the seven allied health professions and related primarily to the department heads' role of manager/supervisor rather than clinician. The list of problems currently faced by allied health department heads is arranged by frequency in Table VIII.

TABLE VIII
PROBLEMS CURRENTLY FACED BY ALLIED HEALTH DEPARTMENT HEADS

Employee motivation (N=53)
Lack of qualified personnel (N=45)
Increasing productivity with minimal staff (N=34)
Reduced staffing (N=20)
DRG budgeting (N=20)
Cost containment (N=13)
Lack of interdepartmental communications (N=11)
Marketing profession (N=10)

DISCUSSION

Knowledge of perceived needs of the target population and desired program characteristics is essential for a planner of continuing professional education. Financial restructuring of the health care system and the resultant emphasis on productivity and cost containment have curtailed resources for continuing education at a time when allied health professionals find themselves in need of new skills to practice in an expanding environment. Continuing education programs must be economically efficient by providing relevant education to groups of professionals. The major costs of program development are instructional and promotional expenses rather than direct per person costs. Therefore, programs held with low registrations are economically inefficient. There will always be some educational needs which can best be met with small group formats, such as "wet workshops" or "hands-on" practice of modalities. However, efficient use of instructional expertise and administrative resources can only occur with knowledge of the target populations' needs.

The distinction between needs, perceived needs and wants has been debated over the years (5). Robbins suggests that a discrepancy between current conditions and preferred conditions does not become a need until it is felt or perceived as needed by the individual (6). If it is identified solely by one's superior, for example, and not by the individual, it is really the superior's need. In a system where continuing education is voluntary, as with five of the seven allied health professions studied*, it is useful to study the perceived needs of the individual because these are the needs upon which one will act. Even for those with mandatory continuing education requirements, the choice of which continuing education programs are attended is usually the individual's. Objective identification of practice-based continuing education needs is rarely available for a true research design. This does not diminish the importance of seeking such opportunities if resources can be secured to do so. In the absence of such research, however, a study of perceived needs is quite valuable to the program planner.

Population

Sources of needs identification for continuing professional education are societal, organizational and individual. Using individual health care practitioners as a source of needs assessment permits one to identify learning needs of knowledge, understanding, skills, attitudes, values and interests.

This study was limited to the perception of needs by Ohio allied health department heads. The results have potential implications for allied health professionals in other areas, however, due to the large number of allied health professionals in Ohio and their distribution among a wide range of hospital sizes. For example, Ohio ranks fourth in the number of American Dietetic Association members per state (7).

A second limitation of the study was the response rate of 51% although it was higher than previous studies of this type (4,7,8). The response rate was as expected for mailing questionnaires to the "Director" of each department due to the lack of specific names. The sample size was large, however, (N=780) and represented a good distribution among the seven allied health populations and a full range of sizes for the employing hospitals. Those responding may have a greater perceived need and, therefore, may be more representative of those who will actually attend continuing education programs in the near future.

Program Characteristics

The identified deterrents to continuing education participation, i.e., programs being too far for travel or too expensive, were consistent with those identified in previous studies (4,7). Occupational and physical therapists indicated a willingness to travel farther than other professionals. This may relate to their interest in two-day programs. In fact, physical therapy was the only group preferring two-day over one-day programs. This may reflect that many programs for therapists are practice-oriented and require skill development such as the neurodevelopmental treatment courses. Occupational and physical therapy were also the only professions preferring programs on Friday and Saturday, 2:1 over other weekdays. The two professions having mandatory continuing education, dietetics and medical record administration, actually participated in fewer hours of continuing education (inservice, external and independent study) than the average for all professions.

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*Dietetics and medical record administration have mandatory continuing education requirements.

A prototype of program characteristics preferred by allied health department heads would be a one-day program, held on a Friday, within 95 miles for a fee of $64. These findings are consistent with the experience of the Office of Continuing Education of the Ohio State University, School of Allied Medical Professions in 1985. Responses differed significantly, however, from that preferred by allied health professionals in 1977 (4) in which a one-day program on Saturday within 20 miles for $20 was the reported prototype.

Program Topics

The non-clinical topics most frequently requested by allied health department heads differed from the priorities of allied health professionals in 1977 (4). The top three topics (computer applications, marketing self/department, and personnel motivation) were not among the top 25 in the previous study. The topics related directly to the identified problems currently faced by the respondents. The problems themselves were quite interrelated, reflecting the financial restructuring of health care systems and staffing patterns occurring in acute care facilities.

The clinical topics perceived as needed by allied health department heads were numerous. Although the top six for each profession are listed here, most professions identified 20-30 different topics relating to their health care delivery role. The number of individuals requesting the same topic was often small. To meet these specialized needs, the program planner will need to promote topics broader than a state-wide basis to attract sufficient registrants to support programming. Alternatives, such as independent study and interdisciplinary programming, should also be considered.

SUMMARY

Identification of topics needed for continuing education of allied health department heads and the desired program characteristics to maximize attendance is essential for efficient program planning. Non-clinical and clinical topics listed in Tables VI and VII will be useful referents for program planners who wish to trigger needs verification of their local target populations. Knowledge of preferred program characteristics of length, day, fee and distance will maximize accessibility of programs, enabling planners to have realistic expectations regarding program attendance.

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PART III

CLINICAL RESEARCH STUDIES

This part of the Symposium included four presentations in which clinical research studies were described:

Flow Monitoring in the Asthmatic Child

Treatment and Prevention of Hemolytic Disease

Use of Enteral Feeding Tubes

Serological Studies on Red Cells of a Gorilla Family

84

HOME PEAK FLOW MONITORING IN THE ASTHMATIC CHILD

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ABSTRACT

Asthma is a chronic disease which affects 1.5 million children in the United States. It is the leading cause of school absenteeism and is associated with family stress and disruption. Medication, biofeedback, environmental manipulation and educational programming have been used to reduce the frequency and severity of acute asthma attacks. Peak flow rate monitoring has been used in hospital emergency rooms, pediatric units and ambulatory settings to diagnose asthma, follow the course of an acute attack, determine the need for hospitalization, and to regulate medications.

This study has evaluated the impact of home peak flow monitoring in the management of the family with chronic asthma. Twenty sets of matched pairs of asthmatic children between the ages of 5-15 years were randomly assigned to control and experimental groups. Control subjects signed a consent to participate, had chart reviews performed, and completed a questionnaire six months later. Experimental subjects completed the above and used a mini-Wright peak flow monitor four times a day at home to monitor the child's respiratory status.

Data from the chart review and questionnaires were submitted to ANOVA, t test and Pearson correlation coefficient testing. Home peak flow monitoring significantly reduced parental stress regarding their childs' asthma and aided the researchers in effective management of the childhood asthmatic. Home peak flow monitoring facilitated education of the patient population and improved patient compliance.

The study has demonstrated the effectiveness of home peak flow monitoring in promoting optional care to chronically ill children with asthma. Home peak flow monitoring is cost effective and promotes collaborative health care delivery.

INTRODUCTION

Asthma is the most common chronic disease of childhood. An estimated 1.5 million children suffer from this condition, which is the most frequent cause of school absenteeism in the United States (Asthma Foundation, 1979). Asthma impacts on family development and produces fear and stress.

Peak expiratory flow rate (PEFR) is a paid assessment of pulmonary function which has been utilized to determine the amount of obstruction to air flow present in the asthmatic (Wright et al, 1959). A valid peak expiratory flow requires a maximum exhalation from total lung capacity. This measurement represents the maximum expiratory flow occurring within the first 150 msec of expiration. It is both effort and volume dependent (Van As, 1982). Changes in peak expiratory flow rate, however, may be seen prior to the onset of wheezing or other symptoms.

The Wright peak flow meter has been used in clinical practice since 1959 to determine peak expiratory flow rate. It has been a valid and reliable tool. Recently, smaller devices to measure peak expiratory flow have been developed. These devices, in addition to being smaller, are easier to handle and less costly. Oldham et al (1979) and Perks et al (1979) compared the reliability of the miniature Wright peak flow meter with the standard Wright peak flow meter. Both studies found high correlations between values obtained from the standard and miniature units. Oldham et al reported agreement within 3% of the value obtained for the standard unit. This is the same correlation as could be obtained by comparing two standard units. Monitoring of peak expiratory flow rate has been utilized in adults and children to assess response to emergency treatment and the need for hospitalization (Banner et al, 1976; Martin et al, 1982). Measurements, obtained serially over time, have documented the presence of absence of obstructive, and sometimes, restrictive pulmonary disease. Daman (1984), Bondi and Williams (1977) used PEFR to guide the therapy of patients hospitalized with severe asthma.

Use of PEFR has also been employed in the home management of the asthmatic patient. Battis et al (1982) reported the use of PEFR monitoring to regulate medications in an outpatient setting. Prior and Cochrane (1980) used PEFR monitoring to establish a diagnosis of asthma in certain suspect patients. Most of the literature reported to date has dealt with application of PEFR monitoring to the medical care of asthmatics in the home, emergency room, physician's office or hospital setting.

In addition to the use of PEFR monitoring, several researchers have explored alternative strategies to reduce asthma related morbidity. Clark et al (1982) and Walsh (1980) have used educational programming and family support to improve patient compliance and reduce emergency room visits. Anderson et al (1983) evaluated school absenteeism in asthmatics to determine degree of disease disability and family disruption. The findings in this epidemiologic study suggest that many mild to moderately effected children may have development disability due to their illness.

METHODOLOGY

Twenty matched pairs of subjects were selected from the allergy practice of the coinvestigator. The children ranged in age from 5 to 15 years. Subjects were matched on sex, age, severity of asthma, time since diagnosis, and family composition. Informed consent was obtained from all subjects chosen to participate in the study. Although parental consent was obtained for the consent of minors, children over age seven were also asked to read and sign the consent form. Random assignment of each matched pair to either the experimental or control group was completed. A sealed envelope technique was utilized.

Subjects in the control group received usual asthma care. Office education, periodic office visits, and customary medications were continued. A log was maintained for each subject of all telephone contacts, office visits, emergency room visits, and hospital admissions. At the end of six months a questionnaire was sent to each subject's family for completion.

Subjects in the experimental group received a mini-Wright peak flow meter at the first visit following receipt of the signed consent form. Technique for performing PEFR was reviewed with the subject and a parent. Records were provided for the recording of PEFR's four times each day. A log was maintained for each subject of all telephone contacts, office visits, emergency room visits, and hospital admissions. At the end of six months, peak flow meters were returned to the office and a questionnaire was sent to each subject's family for completion.

RESULTS

Thirty-nine of 40 subjects completed the study. One subject in the expirimental group moved during the six month experimental period. Data from the matched pair was eliminated from the final data analysis due to this subject loss. Abstracted data from chart records was collected along with the logs of patient contact for the 38 remaining subjects. Office visits for asthma treatment or follow-up were calculated. Office visits for gastrointestinal symptoms in children not on theophylline were excluded from final analysis. In the experimental group, the mean number of office visits was 7.9 with a range of 3 to 36. The control group had a mean number of office visits of 7.38 with a range of 3 to 35. There was no difference between groups in the frequency of office visits.

The experimental group had 7 emergency room visits during the study. Six subjects accounted for the 7 visits. The control group had 14 emergency room visits with seven subjects accounting for these visits. Using ANOVA testing, this data approached signficance with a $p = .20$. A t test was performed, however, and this yielded a $p < 01$. There was a significant difference in number of emergency room visits between groups.

There were four admissions to the hospital in the experimental group from four subjects. All had been seen in the emergency room prior to hospitalization. There were 10 hospital admissions in the control group. Six subjects accounted for these admissions. One subject had 3 admissions, two subjects each had two admissions. T test yielded $p < 01$ for hospital admission by group. Again, there was a significant difference in number of hospital admissions between the two groups.

Twenty-two questionnaires were returned, 13 from the experimental group and 9 from the control group. Although there was no difference between groups in perceived severity of asthma, the experimental group felt better prepared to deal with the illness. Eighty five percent of the experimental subjects felt better able to cope with their child's illness. Only 60% of the control group felt better able to deal with the illness.

Pearson correlation coefficients were calculated from the items on the questionnaires. Two items appear to correlate with positive parent perception of their child's illness. Availability of peak flow meters increased parents feeling of comfort with their child's illness in 18 of 19 subjects. Pearson r of .99 was obtained with $p < .001$. Education received at the time of office visits had a correlation coefficient of .33 with $p < .1$. All other information tested did not yield significant correlation coefficients.

DISCUSSION

At the termination of the study, experimental group families were able to purchase the peak flow meters, if desired. Twelve of the families exercised this option. Comments received from the families indicated that peak flow rate determinations helped parents better assess the need for professional intervention. Several of the families felt that they were now able to determine need for supplemental medications. Two families used the peak flow meter as a part of the weaning process from daily medication. The one family without positive feelings about the peak flow meter had a teenage daughter with exercise induced bronchospasm. During the early part of the study she sustained a knee injury and required surgery. This injury prevented her participation in contact sports and hence, eliminated her exercise induced bronchospasm. When the mother returned the peak flow meter to the office she sent a letter explaining why she had been unable to effectively use the device.

SUMMARY AND CONCLUSIONS

Home peak flow rate monitoring is effective in reducing the need for emergency intervention. It allows the asthmatic to recognize signs of physical deterioration prior to the onset of wheezing or profound bronchospasm. Earlier recognition of change in condition facilitated office visits and telephone consultation rather than emergency room visits and hospitalization. As concern increases over escalating health care costs, facilitation of ambulatory and preventive services will greatly impact both the provider and the recipient of health care services. Home peak flow rate monitoring can, therefore, serve as a cost effective tool in the management of chronic asthma.

Furthermore, parental stress and fear often lead to increased utilization of health care resources. If home peak flow rate monitoring can reduce parental fear and anxiety, there may also be a significant reduction in utilization of the health care system to reduce anxiety.

It has long been recognized that knowledge helps provide control. Since parents provide 24 hour caretaking responsibilities for their children, they need to feel in control. Use of home peak flow rate monitoring has been demonstrated to facilitate parental control.

This study has shown that the use of one peak expiratory flow rate monitoring can be a helpful adjunct to therapy in chronic asthma. At a purchase price of $60, these units are affordable and cost effective. Future studies may need to examine long-term impacts of increased home management. Questions which must be answered are:

1) Will patients omit follow-up visits?
2) Will the child only be seen when parents suspect illness?
3) Will medication be changed without consultation?
4) Will famililes depend on a tool rather than professional judgment in the management of their child?

While home peak flow rate monitoring has proven to be an effective adjunct to care, it does not eliminate the need for a collaborative approach to health care delivery.

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COLLABORATIVE RESEARCH ON THE TREATMENT AND PREVENTION OF HEMOLYTIC DISEASE OF THE NEWBORN

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INTRODUCTION

An interdisciplinary committee, called the Isoimmunozation Committee is responsible for conducting research on the Hemolytic Disease of the Newborn as well as monitoring the progress and treatment of sensitized pregnancies. The committee includes representatives of the departments of Pediatrics, Obstetrics and Gynecology, Pathology and the Hospital Transfusion Service. The main objective of the committee is to review the latest obstetrical and serological information on each patient on a weekly basis and make recommendations for further treatment and follow up. As a research group, the committee is responsible for developing assays, analyzing data and correlating the outcome of pregnancy with the trends observed during gestation.

MATERIALS AND METHODS

When a pregnant is found to have an alloantibody(ies) in her serum during routine prenatal testing or is referred to us from another hospital, the Transfusion Service initiates the isoimmunization workup on behalf of the committee. The initial workup involves antibody identification, antibody titer, and determination of the immunoglobulin class. The Transfusion Service also obtains prior transfusion and obstetrical history and conducts a literature review on the clinical significance of the alloantibody identified. This data is then submitted for committee review. Based on these findings, the committee recommends either repeat antibody titer or an amniotic fluid analysis. Subsequent follow ups are primarily based on the amniotic fluid analysis and the committee's experience with the similar patients in the past. The decision making process can be best described in the form of a flow-chart (Figure 1). If the amniotic fluid analysis reveals a severely affected fetus, the committee may recommend intrauterine transfusion (IUT), or preterm induction of labor. If the newborn is found to be severely anemic or jaundiced, an immediate exchange transfusion may be recommended.

RESULTS

Since its inception in 1968 the committee has followed 716 patients through one or more sensitized pregnancies. Anti-D alone or in combination with anti-C was found to cause the most severe cases of Hemolytic Disease of the Newborn (HDN). Of the 125 IUTs done during this period, 121 were done in cases of HDN due to anti-D. Since the introduction of Rh Immune Globulin in the late 60's, the incidence of HDN due to anti-D has declined from 90% to less than 40% of the total cases studied by the committee (Figure 2).

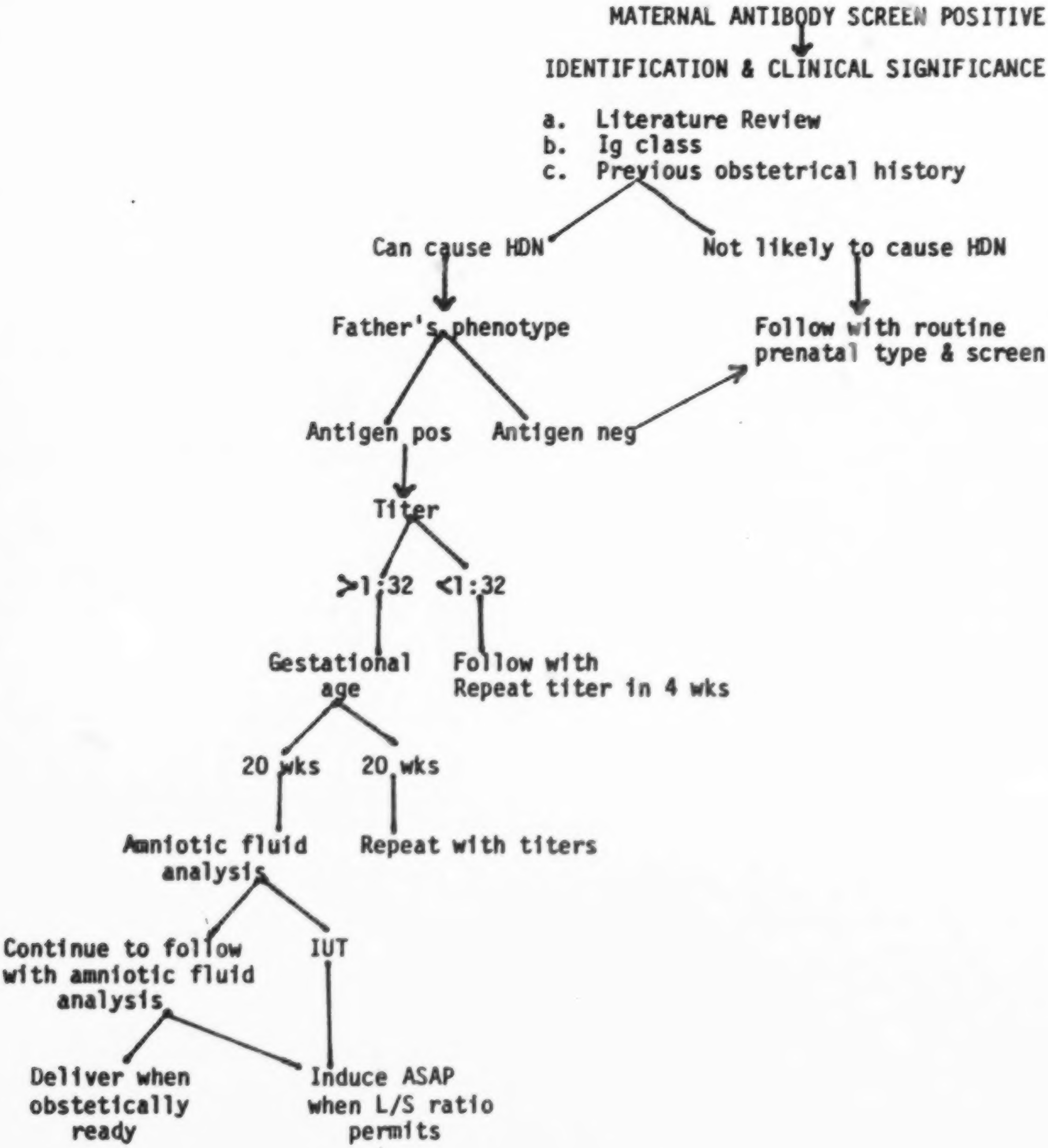
MATERNAL ANTIBODY SCREEN POSITIVE
IDENTIFICATION & CLINICAL SIGNIFICANCE
a. Literature Review
b. Ig class
c. Previous obstetrical history
Can cause HDN
Not likely to cause HDN
Father's phenotype
Follow with routine prenatal type & screen
Antigen pos
Antigen neg
Titer
>1:32
<1:32
Gestational age
Follow with Repeat titer in 4 wks
20 wks
20 wks
Amniotic fluid analysis
Repeat with titers
Continue to follow with amniotic fluid analysis
IUT
Deliver when obstetically ready
Induce ASAP when L/S ratio permits

FIG. 1. FLOW CHART OF Rh ISOIMMUNIZATION COMMITTEE'S DECISION MAKING PROCESS

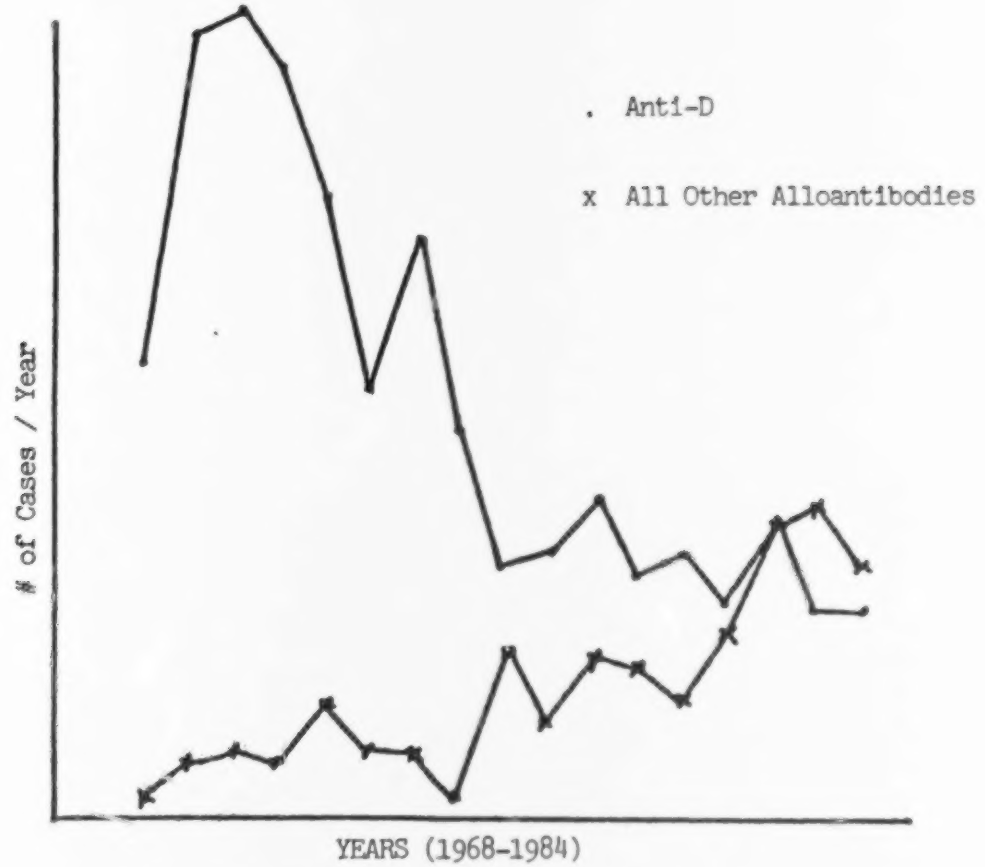

Fig. 2. Alloantibodies involved in Hemolytic Disease of the Newborn

DISCUSSION

Continued monitoring of the sensitized pregnancy through one interdisciplinary group ensures proper communication and flow of information. Data needed for research on various aspects of the disease can be collected and analyzed in a proper format. Expertise of the committee in monitoring and treating hemolytic disease of the newborn due to anti-D is readily applied to other alloantibodies as well. The committee's active involvement in research and development has led to the publication of a number of scientific papers.

PROSPECTIVE STUDY OF NUMBER EIGHT FRENCH ENTERAL FEEDING TUBES IN THE CLINICAL SETTING

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ABSTRACT

The purpose of this study is to document the advisability of the Number Eight French Nasogastric Feeding Tube in all areas of patient care for enteral nutrition support. Major concerns are patient comfort and effectiveness of equipment. A functional cost effective standard is sought for the hospital, i.e. enteral nutrition support.

The Clinical Nutrition Committee was concerned with problems of contamination and of blocked feeding tubes. Tejinder S. Bal, M.D., Chairman of the Committee, assigned a study be conducted to determine the facts for the committee. The membership of the committee includes physicians, dietitians, a nurse, a pharmacist and a hospital administrator. The study was assigned to the Director of Clinical Nutrition and the Administrative Coordinator of Nursing Services.

Research will be a longitudinal study of fifty patients utilizing the Number Eight French Nasogastric Tube. The patient population will include a randomized sample of patients throughout the 756 bed hospital and include all clinical specialty areas. However, no more than three patients per nursing unit will be included in the study to assure proper monitoring. Nursing and Clinical Nutrition staff, taking into consideration the committee's concerns, developed a data collection form for the study. This form includes input from all three nursing shifts and dietitians as to specific data requested. Periodic monitoring of the tube is required. Specific data to be recorded includes feeding viscosity, medications, condition of tube, pump delivery of product (if pump is being used), any other additions to the tube and patient comfort level.

Pilot testing of the forms was conducted in June of 1985. Data collection began in July. Major documentation was completed by nursing staff; assigned clinical dietitians compiled a daily review and summary sheet with detailed documentation of any complications. Weekly review of the summary sheets were conducted by assigned Clinical Nutrition Committee members.

Findings are to be reported to the Clinical Nutrition Committee and a recommended standard for the hospital will be forwarded to appropriate departments.

INTRODUCTION

Prevention of malnutrition and avoidance of a nitrogen deficit in patients prompted Saint Elizabeth Hospital Medical Center, Youngstown, Ohio, to begin using enteral feedings in the mid to late 1950's. These feedings consisted primarily of the administration of blenderized foods, usually as bolus feedings through large-bore nasogastric tubes. These proved efficient because the large particle size kept osmolarity to a minimum and prevented many gastrointestinal side effects (1). However, patients rarely received adequate calories and were exposed to risks from the large-bore nasogastric tubes (2).

In the mid to late 1960's, to improve the quality of nourishment delivered via tube feeding, the Barron Food Pumps were utilized to deliver continuous feedings of the Hospital Blended Formulary (3). Tube feedings could be ordered from 1000 kilo- calories to 4000 kilocalories with complete information, i.e. composition and ingredients, documented in the nutrient analysis manual for tube feedings. Because the formula was packed in ice for food safety, patients were exposed to "cold" feedings with resulting cramping and discomfort. This discomfort, plus that of the large bore tube and potential toxic effects of smaller bore tubes with mercury weighted guide tip, caused staff to keep seeking better solutions.

Published research on homemade formulas and availability of prepared formulas, resulted in a discontinuation of the hospital's blended formula (4,5). A variety of commercial formulas are tested and retested at regular intervals by the hospital's Clinical Nutrition Committee. In addition to the taste test, the nutrient composition is investigated in relation to the patient population needs. This list and its composition is made available to all appropriate staff for their use.

Gravity drip of enteral feeding is now recognized as dependable for all patients receiving enteral alimentation. The drip is adjusted to a patient's position, but it may become ineffective when the patient moves (3,6). The Kangaroo pump is now being used for those patients where accurate fluid/flow monitoring is an integral component of the nutrition care plan. Until adequate numbers are available the clinical dietitian places a patient on the pump per the established policy of the Clinical Nutrition Committee.

STANDING ORDERS

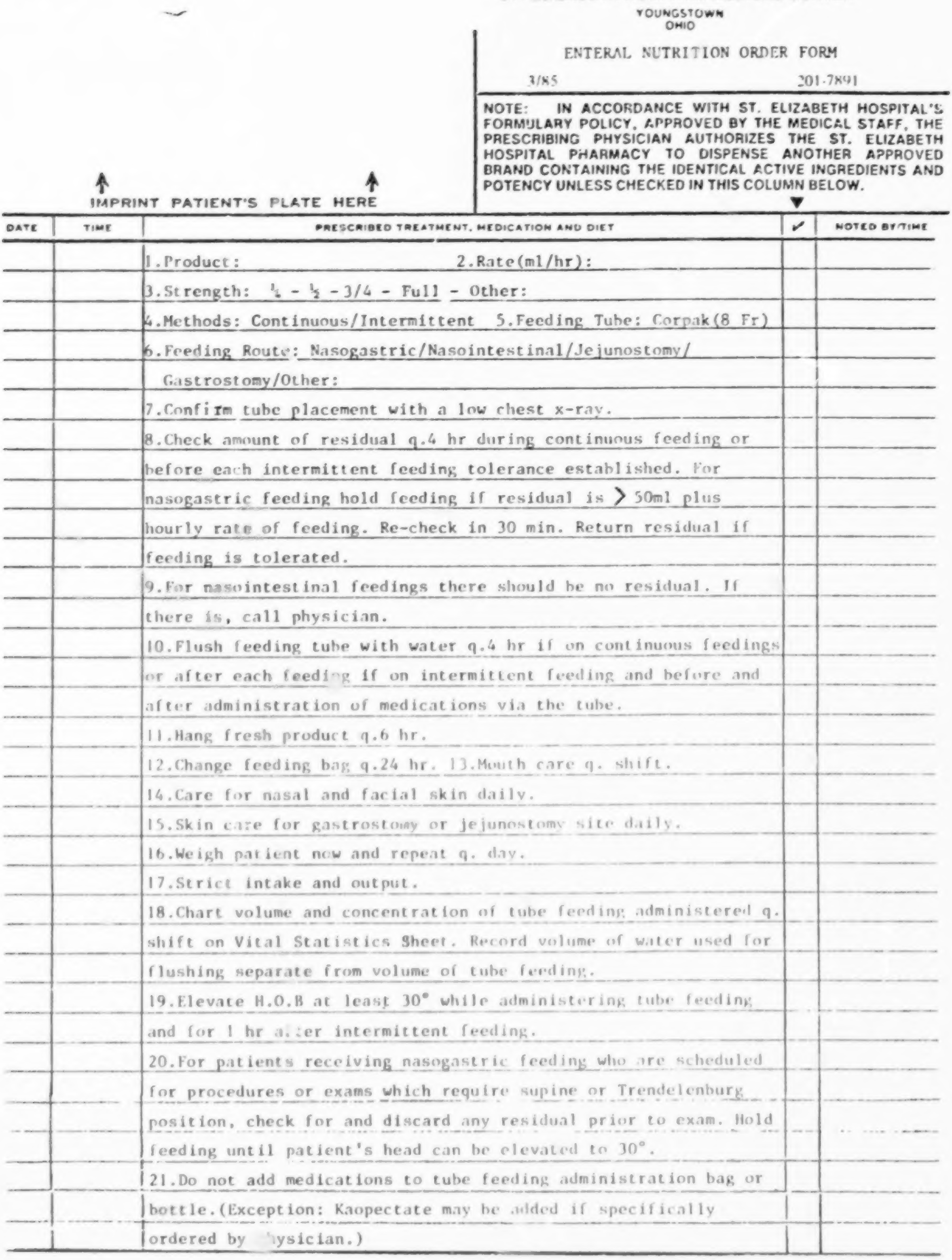
To comply with quality assurance standards it was determined by the Committee that a standing Enteral Nutrition Order Form should be developed. In addition, more patients were being placed on enteral feedings as well as more admitted and discharged patients having tubes in place. Achieving a consistant ongoing protocol would facilitate staff reassignments and communication as well as improved patient care (7). The order form (Figure I) addressed all the concerns of nurses, dietitians, and physicians. On the reverse side of the form is a list of products currently available for use and the nutrient composition of each.

Clinical Nutrition and Nursing Service procedures were revised to reflect the standing order form. In-service programs were subsequently conducted for relevant personnel throughout the Medical Center. With these procedures in place the study could begin.

PURPOSE OF THE STUDY

A longitudinal study was designed to investigate and document the advisability of the Number Eight French Nasogastric Feeding Tube in all areas of

Figure 1



ST. ELIZABETH HOSPITAL MEDICAL CENTER
YOUNGSTOWN
OHIO

ENTERAL NUTRITION ORDER FORM

3/85 201-7891

NOTE: IN ACCORDANCE WITH ST. ELIZABETH HOSPITAL'S FORMULARY POLICY, APPROVED BY THE MEDICAL STAFF, THE PRESCRIBING PHYSICIAN AUTHORIZES THE ST. ELIZABETH HOSPITAL PHARMACY TO DISPENSE ANOTHER APPROVED BRAND CONTAINING THE IDENTICAL ACTIVE INGREDIENTS AND POTENCY UNLESS CHECKED IN THIS COLUMN BELOW. ▼

↑ IMPRINT PATIENT'S PLATE HERE ↑

DATE	TIME	PRESCRIBED TREATMENT, MEDICATION AND DIET	✓	NOTED BY/TIME
		1.Product: 2.Rate(ml/hr):		
		3.Strength: ¼ - ½ - 3/4 - Full - Other:		
		4.Methods: Continuous/Intermittent 5.Feeding Tube: Corpak(8 Fr)		
		6.Feeding Route: Nasogastric/Nasointestinal/Jejunostomy/		
		Gastrostomy/Other:		
		7.Confirm tube placement with a low chest x-ray.		
		8.Check amount of residual q.4 hr during continuous feeding or		
		before each intermittent feeding tolerance established. For		
		nasogastric feeding hold feeding if residual is > 50ml plus		
		hourly rate of feeding. Re-check in 30 min. Return residual if		
		feeding is tolerated.		
		9.For nasointestinal feedings there should be no residual. If		
		there is, call physician.		
		10.Flush feeding tube with water q.4 hr if on continuous feedings		
		or after each feeding if on intermittent feeding and before and		
		after administration of medications via the tube.		
		11.Hang fresh product q.6 hr.		
		12.Change feeding bag q.24 hr. 13.Mouth care q. shift.		
		14.Care for nasal and facial skin daily.		
		15.Skin care for gastrostomy or jejunostomy site daily.		
		16.Weigh patient now and repeat q. day.		
		17.Strict intake and output.		
		18.Chart volume and concentration of tube feeding administered q.		
		shift on Vital Statistics Sheet. Record volume of water used for		
		flushing separate from volume of tube feeding.		
		19.Elevate H.O.B at least 30° while administering tube feeding		
		and for 1 hr after intermittent feeding.		
		20.For patients receiving nasogastric feeding who are scheduled		
		for procedures or exams which require supine or Trendelenburg		
		position, check for and discard any residual prior to exam. Hold		
		feeding until patient's head can be elevated to 30°.		
		21.Do not add medications to tube feeding administration bag or		
		bottle.(Exception: Kaopectate may be added if specifically		
		ordered by physician.)		

PHYSICIAN'S ORDER SHEET

Figure 1b

Product Information Chart*

PRODUCTS	kcal/cc	Amount	PRO gm.	FAT gm.	CARB. gm.	NA meq.	K meq.	Osm.	Nonprotein Calorie:gN
MILK-BASED									
Carnation Instant Breakfast	1	Liter	50	27	117	38	64	700	88:1
LACTOSE FREE									
Citrotein	.66	Liter	43	2	129	30	18	500	78:1
Ensure	1	Liter	37	27	143	32	32	450	153:1
Ensure Plus HN	1.5	Liter	63	50	201	51	47	650	125:1
Enrich	1	Liter	39	37	160	37	40	480	156:1
Isocal	1	Liter	34	45	130	23	34	300	167:1
Magnacal	2	Liter	70	80	250	44	32	590	154:1
ELEMENTAL									
Vivonex Standard	1	Liter	20	1.5	226	37	30	550	286:1
Vivonex T.E.N.	1	Liter	38	5	206	20	20	630	145:1
SPECIAL FORMULAS									
Amin-Aid	2	Liter	19	46	366	14	<5	1095	380:1
Hepatic-Aid II	1.6	Liter	43	36	287	14	<5	1158	215:1
MODULAR PRODUCTS									
Polycose Powder	4/gm.	100 gm	-	-	94	5	0.2	-	-
Polycose Liquid	2	Liter	-	-	500	30	10	850	-
Pro Mix R.D	17/T.	4 T.	15	0.8	1	2	4	-	-
MCT Oil	7.5	1 T.	-	14	-	-	-		-

* These are the products currently available at St. Elizabeth Hospital Medical Center

patient care for enteral nutritional support. Improvement in the quality of care provided to the tube-fed patient and the establishment of a functional cost effective standard for enteral nutritional support for the hospital were the ultimate purposes of the research effort (8). The major concerns being addressed were: (1) patient comfort; (2) effectiveness of the tube in the delivery of all enteral nutrition products; and (3) identification and documentation of tube feeding problems, probable cause and recommended therapy.

The availability of small-caliber, inexpensive, non-irritating silicone and polyurethane tungsten weighted tubes renders tube feeding practical for a large group of patients with a variety of medical diagnoses (2,5). Four types of complications associated with enteral alimentation were considered; (1) gastro - intestinal; (2) metabolic; (3) infectious; and (4) mechanical. Possible causes for each complication were reviewed (9,10,11,12) and are shown below in Table I.

Table I
Tube Feeding Complications and Possible Causes

Type	Complication	Causes
Gastrointestinal	1. Diarrhea	Hyperosmolar solution, lactose deficiency, fat malabsorption, cold feedings, protein malnutrition, bacterial contamination of formula, and drug therapy
	2. Nausea - Vomiting	Improper location of tube tip, excessive rate of feeding, feeding too large volume, anxiety, high osmolatity leading to gastric retention, offensive smell, lactose intolerance, excessive fat in diet
	3. Distention - Cramps	Cold feedings, "Catch-up" feedings, gastric atony-stomach emptying slowly, obstruction, volume of formula
Metabolic	1. Overhydration	Severe malnutrition and refeeding, significant cardiac and hepatic disease
	2. Dehydration	Excessive diarrhea, inadequate fluid intake, carbohydrate intolerance, hypertonic formula administered to patient unable to communicate or respond to thirst, excessive protein intake
	3. Hyperglycemia	Carbohydrate intolerance - inadequate insulin
	4. Glycosuria	Carbohydrate intolerance
Infectious	1. Aspiration	Subtle regurgitation of stomach contents, regurgitation due to head of bed not elevated at least 30 degrees, improper tube placement patient's at high risk: severely debilitated, comatose, restrained

	2. Bacterial Contamination	Poor nursing technique - no hand washing, lack of asceptic technique use in preparation of product, faulty manufacturing
Mechanical	1. Dislodged Tube	Tube removed deliberately
	2. Clogged/Kinking of Tube	Improper flushing, hyperactive peristalsis, faulty tube, crushed medications given via tube, viscosity of formula, medications mixed in tube feeding
	3. Sore Nose or Throat	Absence of chewing which stimulates salivary secretions, pressure from tube
	4. Hoarseness	Irritation of mucous membranes of the larynx from the presence of the tube
	5. Dry Mouth	Medications related, dehydration, presence of tube, distressing experience to patient
	6. Runny Nose	Sinus tract occluded by tube
Other	1. Skin Reactions	Allergic reaction to the product being administered
	2. Malnutrition	Inadequate nutrition over time
	3. Decubiti	Inadequate nutrition - depletion
	4. Decreased Bowel Sounds	GI tract non-functioning
	5. High Gastric Residuals	Too much volume, rapid rate
	6. Hiccups	Anxiety, excessive inspiration rate, disease process affecting involuntary muscle contractions, gas forming drugs

METHODOLOGY

An interdisciplinary approach to the study was recommended by the Clinical Nutrition Committee. Participation by house staff physicians, nursing service personnel and the clinical dietitians was coordinated by the Director of Clinical Nutrition, Administrative Coordinator Nursing Service and Chief Resident.

PATIENTS

Thirty-four patients were included in the study. The tube feeding patient population averages 35-40 patients per day at the Medical Center. Many different types of tubes are used in the Center: levine, percutaneous gastrostomy, needle catheter jejunostomy, larger bore tubes and the Number Eight French Corpak Tube. The patients with a Number Eight French Corpak Tube were randomly selected by the clinical dietitians throughout the 756 bed medical center. At the outset of the study limitations in terms of number of patients per nursing unit and age were determined essential to assure proper monitoring of all patient data.

DATA COLLECTION

A data collection form (Figure II) was developed to encompass the concerns and objectives of the study. It was designed for daily completion including input from all three nursing shifts and the clinical dietitians.

RESPONSIBILITIES

Nursing personnel were responsible for monitoring the daily care process and completing the data collection form for each patient included in the study. Active communication with clinical dietitians was encouraged regarding patient care problems and concerns.

Clinical dietitians coordinated nutrition support and documented patient energy requirements based on the Benedict-Harris Formula. Daily review of the patient's medical record was completed and pertinent nutritional parameters and complications were highlighted. Documentation was completed on the appropriate portion of the data collection form.

The house staff physician reviewed all data collected. Visitation to the patient care units was conducted in a timely fashion to monitor and evaluate laboratory values, to investigate complications and identify their causes and to institute proper therapy. Medical record documentation was completed when deemed appropriate.

Data were summarized for each patient at the end of each one's intubation period.

RESULTS

Thirty four patients were included in the tube feeding study population. Intubation periods using Number Eight French Tubes ranged from one to eleven days with the average time in the study being 5.2 days.

Eight products from the Enteral Formulary were utilized for patients in this research effort (Table II).

Table II
Enteral Formulary Products In The Study

Product	Manufacturer	Number of Patients on Formula
Isocal	Mead Johnson	14
Magnacal	Biosearch	7
Ensure	Ross Laboratories	3
Pulmocare	Ross Laboratories	2
Amin-Aid	American McGaw	2
Hepatic-Aid II	American McGaw	1
Vivinex T.E.N.	Norwich-Eaton	1
Ensure Plus HN	Ross Laboratories	1
Combination of Products		3

Kangeroo feeding pumps were used for 53% of the participants, the remaining 47% had enteral feedings delivered by the gravity drip method.

Figure 2a

To Be Filled Out By Nursing Service

St. Elizabeth Hospital Medical Center
Youngstown, Ohio
3/85 Revised 7/85

Eight French Enteral Feeding Tube Study

DATE:	QUESTIONS	COMMENTS:
DAYS	1. Is the Kangaroo Pump being used? Yes ___ No ___ 2. At the end of the shift: -What tube feeding product is being used: ___ -What was the rate:(ml/hr): ___ -What was the strength: ___ 3. How many times was the product changed? ___ 4. Did the tube become clogged? Yes ___ No ___ 5. Was medication given via tube? Yes ___ No ___ If yes, list medications: ___ 6. Was medication added to the tube feeding product? Yes ___ No ___ 7. List any other items that may have been given via tube: (example: food) ___	
EVENINGS	1. Is the Kangaroo Pump being used? Yes ___ No ___ 2. At the end of the shift: -What tube feeding product is being used: ___ -What was the rate:(ml/hr): ___ -What was the strength: ___ 3. How many times was the product changed? ___ 4. Did the tube become clogged? Yes ___ No ___ 5. Was medication given via tube? Yes ___ No ___ If yes, list medications: ___ 6. Was medication added to the tube feeding product? Yes ___ No ___ 7. List any other items that may have been given via tube: (example: food) ___	
NIGHTS	1. Is the Kangaroo Pump being used? Yes ___ No ___ 2. At the end of the shift: -What tube feeding product is being used: ___ -What was the rate:(ml/hr): ___ -What was the strength: ___ 3. How many times was the product changed? ___ 4. Did the tube become clogged? Yes ___ No ___ 5. Was medication given via tube? Yes ___ No ___ If yes, list medications: ___ 6. Was medication added to the tube feeding product? Yes ___ No ___ 7. List any other items that may have been given via tube: (example: food) ___	

Figure 2b

To Be Filled Out By Clinical Dietitian

DATE: ____________________ DIAGNOSIS: ____________________

WEIGHT: ________ lbs. TEMPERATURE: ________ °F

Head of bed elevated 30°: Yes ______ No ______

Required Calories: __________ Calories Consumed - 24 hours: __________

Total Intake: __________ cc's Output: __________ cc's Flushing: __________ cc's

Record the following lab data if current Date Run: ____________________

Protein: _____ g/dl Albumin: ________ g/dl Transferrin: ________ Total Lymphocyte Count ________

ELECTROLYTES: Na ______ K ______ Ca ______ P ______ Other ______________

Please check if any of the following complications are present and cause and therapy if appropriate:

COMPLICATION	CAUSE	THERAPY
ASPIRATION		
DIARRHEA		
DISTENTION/CRAMPS		
NAUSEA/VOMITING		
SKIN REACTION		
SORE THROAT OR NOSE		
HOARSENESS		
DRY MOUTH		
RUNNY NOSE		
DEHYDRATION		
OVERHYDRATION		
BACTERIAL CONTAMINATION		
DISLODGED TUBE		
CLOGGED/KINKING OF TUBE		
HYPERGLYCEMIA		
GLUCOSURIA		
OTHER		

Occlusion of the tube was a problem for 15% (5 patients) of the participants. All of the patients with occlusion had multiple medications administered via the tube and in most cases had inadequate documentation of appropriate flushing as the standard nursing procedure indicates. Pump delivery was used for four of the patients with the occluded tubes. One patient on gravity drip had a tube which became occluded. However, most of these tubes did not occlude until after the third day of the study, as shown in Table III.

Table III
Summary Of Data Of Occluded Eight French Tubes

PATIENT	NUMBER OF DAYS IN STUDY	PUMP (YES/NO)	FLUSHING AV. CC'S/DAY	PRODUCT	DAY OF OCCLUSION	MEDS VIA TUBE(YES/NO)	30^{o} BED ELEVATION(YES/NO)
1	5	Y	64	Magnacal	5	Y-10	Y
2	10	Y	290 288 457	Ensure(1) Magnacal(6) Isocal(3)	5 dark grey cement like substance	Y-1	Y
3	7	Y	0 165	Vivonex TEN(5) Ensure Plus HN(2)	6	Y-3	N
4	5	Y	78	Vivonex TEN(1) Amin-Aid (4)	5	Y-1	Y
5	3	N	66	Isocal plus oral diet	2	N	Y

In reviewing the data collected for all 34 patients, it was noted that the head of the bed was elevated 30 degrees 91% of the time. Medications were administered via tubal route for 59% of the population. The standing Enteral Nutrition Order Form requires documentation of daily weights. Compliance was present for only 29% of these patients. Weights were recorded on a non-regular basis for 44% of the patients. The remaining 27% had no recorded weight.

The Harris-Benedict Formula for calculation of basal energy expenditure requires the weight, height and age of the patient for proper completion. Caloric requirements were calculated for 79% (27 patients) of the population, 21% (7 patients) did not have a caloric goal due to lack of basic data - height and weight.

The caloric goal was reached by 37% of the patients while on this study. The breakdown of this 37% by diagnosis was: cancer -5 patients; cardiovascular -3 patients; GI disturbance -1 patient; and sepsis -1 patient. These patients achieved caloric goals even though there were documented complications including diarrhea, occlusion of tube, nausea, vomiting, cramps and decreased bowel sounds. Sixty-three percent of patients did not achieve caloric requirements. The diagnosis breakdown for these 17 patients was: cancer -9 patients; cardiovascular disease -5 patients; GI disturbance -1 patient; sepsis -1 patient; and respiratory failure -1 patient (this patient expired). Similar complications were experienced by patients in this group. In addition, hiccups, weakness, high residuals, dehydration, overhydration, weight loss, and patients pulling the tube out contributed to the inability to achieve caloric goals.

The complications reported during this study coincide with those documented in the literature. A summary of the specific complications and probable causes are illustrated in Table IV. Appropriate medical attention and therapy was initiated in each individual case.

Table IV
Summary of Complications

Complication	Number of Patients	Probable Causes
Diarrhea	7	Hyperosmolarity, disease process, multiple medications, multiple organ failure
Distention/ Cramps	2	Obstruction, ileus, medications, osmolar load
Nausea/ Vomiting	6	Osmolar load, disease process, diabetic gastric parasesis, contamination, decreased persistalsis, medications
Dehydration	3	Disease process, excessive diarrhea, hyperosmolar formula
Overhydration	1	Disease process - cardiac
Dislodged Tube	8	One vomited out - other 7 pulled out by patients, discomfort, and/or disorientation
Clogged	5	Mechanical handling of the product, medications
Hyperglycemia	1	Diabetes
Hiccups	1	Concomitant chemotherapy, diaphragm irritation
↑Gastric Residuals	3	Decreased peristalsis, disease process

DISCUSSION

It was encouraging to note that 37% of these patients reached the caloric requirements despite the presence of complications. This indicates that enteral nutritional support is an effective modality in the care process if attention to each complication is handled in a timely fashion. During the time on this study, the 17 patients that did not achieve their calculated caloric requirement were being followed by the clinical dietitians. Appropriate recommendations were recorded in the patient's medical records in an attempt to assure the provision of adequate nutritional support. Due to the multiple disease process, multiple medications and complications, the nutritional status of these patients at the outset of the study was questionable. Quantitative and qualitative data were not readily available to verify poor nutritional status. The slow response of these patients to the care programs initiated could be due to the metabolic response characteristic of the critically ill as documented in the literature (12). Nutrition intervention should be aggressively approached in an interdisciplinary manner at the first stage of illness so that patients do not waste endogenous caloric stores and utilize protein as energy (4).

Definite problems in procedural response by the allied health professionals to the care process for the tube fed patient surfaced during this study. The lack of consistency in documentation of weights and heights contributed to the problem of initiating a proper nutrition care program. Improper flushing of the tubes contributed to the occlusions. At this point, the viscosity of the products cannot be considered a contributing factor to occlusion. Medications, other than kaopectate, were added to the formulas. Other medications were administered via the tubes without evidence of proper flushing. The proper administration technique would be in a bolus manner at recommended dosage intervals with before and after flushing of the tube with warm water (14).

Intolerances noted may reflect inadequate attention to detail of the tube feeding protocol and procedures. Appropriate monitoring by all health professionals utilizing specific checklists would enhance the existing procedures thus eliminating the individual's personal interpretation of the written material (1, 13).

RECOMMENDATIONS

The interdisciplinary approach to this research effort enhanced the communication process of all participating health professionals. Each has a new understanding of the others' perspectives with the shared goal of quality assurance for the tube fed patient. The following recommendations resulting from this study are offered:

1) Development of a surveillance system to monitor effectiveness of procedures and medical record documentation.
2) Restructuring of the study to include the checklists and nutritional parameters other than caloric requirements, i.e. nitrogen balance studies.
3) Continue to monitor effectiveness of the Number Eight French Tube to deliver all enteral solutions.

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SEROLOGICAL STUDIES ON THE RED CELLS OF A GORILLA FAMILY

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ABSTRACT

The transfusion service of a large university hospital conducted a joint research project with the metropolitan zoo on the inheritance of blood group antigens in a highland gorilla family. The main objective of the study was the investigation of the possibility of hemolytic disease of the newborn (HDN) as a cause of repeated miscarriages in one of the female gorillas (Toni). The gorilla family was unique in that four consecutive generations were represented.

The first phase of the study consisted of modifying techniques and reagents used in human blood group serology for use with the gorilla red blood cells. In the second phase, techniques were developed to study the presence of alloantibodies in the gorilla sera.

Only two of the five gorillas studied were found to have serum antibody. The antibody in Toni's serum was found to react strongly with all human red blood cells tested. This antibody was also found to react weakly with all other gorillas tested except for her father. The antibody was found to be IgG and thus would be capable of causing HDN.

In terms of antigenic distribution, all gorillas were found to be group B, c+, C-, E-, e-, S-, s+, Fy(a-b+), and Jk^a. As has been reported in the literature, polymorphism was seen only in MN and Lewis systems. An interesting pattern was observed in the inheritance of the Rho(D) antigen. The antigen varied in strength from weak D^u to full strength within this family. Genetic and clinical implications of this observation remain to be determined.

As a result of this investigation, we recommended that with Toni's next pregnancy her serum be tested for the presence of antibody reacting with her mate which could cause HDN.

INTRODUCTION

Primates share many erythrocyte antigens with humans, so human antisera, with modification, can be used to test primates for red cell antigens and antibodies. The Transfusion service of The Ohio State University had the opportunity to test the blood of a family, as well as other individuals, of lowland gorillas living at the Columbus Zoo.

The objectives of the study were to investigate the antigens of four generations of gorillas and investigate the possibility of hemolytic disease of the newborn as a cause of repeated miscarriages in Toni, who had been mated with her brother, Oscar.

MATERIALS AND METHODS

Gorilla blood was collected by venipuncture and transferred to plain 10 ml vacuum tubes and 10 ml citrate phosphate dextrose vacuum tubes, mixing well to prevent clotting. Reagent human antisera were used throughout.

Three reagents were modified by absorption. Gorillas are known to possess the Rh antigens D and c. In order to prove that the positive reactions were valid and not interspecies incompatibility, both anti-D and anti-c were absorbed with human red cells possessing the corresponding antigens. The absorbed reagents were then used as controls in the typing of the gorilla red cells. The antihuman globulin (Coombs) reagent was absorbed with gorilla red cells to remove interspecies antibodies. The absorbed antiglobulin was then used as Coombs serum for testing.

The typings performed on the gorilla red cells were ABO, Rh (D, C, c, E, and e), MNSs, Duffy (Fy), Kidd (JK), and Lewis (Le). The tests were done by standard blood banking agglutination technique according to manufacturers' instructions, with the addition of the control and absorbed sera described above.

In addition, the serum of each gorilla was tested against several examples of human red blood cells. Toni's serum was also tested against each of the gorilla's red cells, i.e., by crossmatching.

RESULTS

All gorillas were found to possess the antigens B, N, c, and Le^b and to lack the antigens A, C, E, e and Fy^a (Table I).

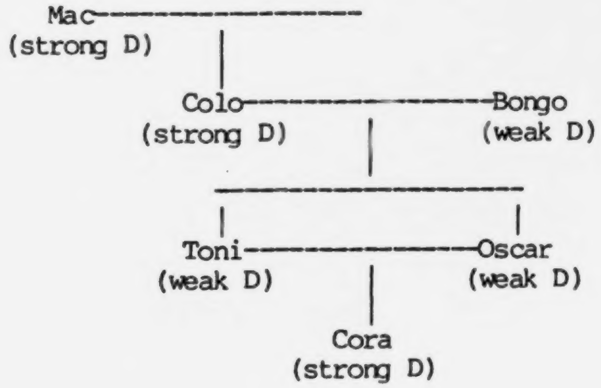
Table I: Red Cell Antigen Testing Results

							Antisera								
Gorilla	ABO	D	C	c	E	e	M	N	S	s	Fy^a	Fy^b	Jk^a	Le^a	Le^b
Mac	B	+	0	+	0	0	+	+	0	+	0	+	+	0	+
Colo	B	+	0	+	0	0	+	+	0	+	0	+	+	0	+
Bongo	B	±	0	+	0	0	0	+	0	+	0	+	+	0	+
Toni	B	±	0	+	0	0	+	+	0	+	0	+	+	0	+
Oscar	B	±	0	+	0	0	0	+	0	+	0	+	+	0	+
Cora	B	+	0	+	0	0	0	+	0	+	0	+	+	0	+
Muke*	B	±	0	+	0	0	+	+	0	+	0	+	+	+	+
Bridgett*	B	+	0	+	0	0	+	+	0	0	0	NT	NT	0	+
Mumba*	B	+	0	+	0	0	0	+	+	+	0	+	+	+	+
Sunshine*	B	+	0	+	0	0	0	+	0	+	0	+	+	0	+
Lulu*	B	+	0	+	0	0	+	+	0	+	0	+	+	+	+

NT = not tested
* unrelated individuals

Although all gorillas were found to be positive with anti-D (with negative controls), 4 of 11 individuals were only weakly positive, compared to strong positives with the others. The inheritance of the weakened antigenic expression is shown by the pedigree shown in Figure 1.

Figure 1: Gorilla Pedigree



One gorilla was not tested for Fy^b and Jk^a; however, all other gorillas were positive for these antigens. Polymorphism was observed with M, Le^a and S as reported in the literature.[1]

Toni and Oscar were both found to have antibody in their sera which reacted with all human red cells tested. Oscar's serum did not react with other gorillas' red cells. However, Toni's serum reacted weakly with the red cells of all other gorillas except Bongo, her father.

DISCUSSION

As previously reported, (1) gorilla red cells share many antigens with human red cells. Unexpectedly, we found, with the testing of four generations, an inherited weakened expression of the Rh antigen D (Rho). This may be analogous to the weakened expression seen in humans called D^u. However, in humans, the weakened expression can be due to interaction of the C and D genes being on opposite chromosomes. However, this mechanism could not explain the finding in gorillas, which do not have polymorphism in the C gene. Humans can also have inherited weakened expression of D due to missing one of four parts of the D antigen. However, this type of D^u in humans is very rare.

We also found antibodies in the sera of Toni and Oscar directed against human red cells. Since both gorillas had close contact with humans during their infancy, this finding is not surprising. However, the finding of antibody in Toni directed against other gorillas would correspond to the antibody in a woman stimulated by pregnancy of an antigenically different fetus. The condition resulting from such mother-fetus incompatibility is termed hemolytic disease of the newborn. The disease has also been termed "Rh disease," "blue baby" and "erythroblastosis fetalis." The antibody crosses the placenta, coating the fetal red cells. The cells are destroyed by the fetal spleen, leading to anemia and, if severe, heart failure and death.

Antibody in mothers can also contribute to fetal wastage through miscarriage. Whether Toni's antibody caused her repeated miscarriages can only be conjectured. However, fetal wastage can also be due to the inheritance of lethal genes when closely related matings occur.

With the next pregnancy, Toni should be repeatedly tested for antibody directed against her mate's red blood cells. In addition, future studies of the histocompatibility antigens and antibodies may help in the elucidation of her repeated miscarriages.

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PART IV

MANAGEMENT RELATED RESEARCH

The fourth part of the Symposium included papers related to management aspects of allied health:

Collaboration of Allied Health with Architecture and Engineering

A Model for Health Needs Assessment

Cost Containment in Clinical Laboratories

Dissemination of Clinical Information

THE LIVING LABORATORY: AN ALLIED HEALTH COLLABORATION WITH ARCHITECTURE AND ENGINEERING

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Decades of effort dedicated to the survival of the severely handicapped were followed by the efforts of physical and occupational therapists to maintain the physical well-being of those survivors. Those endeavors have succeeded to the extent that large populations of severely handicapped individuals reside both within and outside of specialized institutions. The next step should be to provide safe, comfortable and stimulating environments which will enable those individuals to advance their residual physical and mental abilities, gain some independence and acquire new competencies. An understanding of the functional capacity of the profoundly disabled must be augmented by knowledge of architecture and bio-engineering to achieve the goal of enhanced patient self-care and independence.

The Schools of Health Related Professions, Architecture, and Engineering of the State University of New York at Buffalo have initiated a research collaboration under the sponsorship of the New York State Office of Mental Retardation and Developmental Disabilities. This effort will result in the design, construction and equipping of a series of model group residences for the profoundly handicapped which will serve as living laboratories for the introduction of increasingly sophisticated housing designs and adaptive devices. The creation of architecturally receptive settings for the introduction of innovations in furniture, fixtures, and robotic devices will result in dramatic increases in patient control, mobility, communication, independence in the activities of daily living, leisure time utilization and be of long-range cost-benefit by reducing the very high staff-patient ratios that currently exist. These "Living Laboratories" reflect the broad potential for the advancement of the Allied Health professions through collaborative research that is problem oriented and receptive to input from among a broad range of professional disciplines.

This project is in the planning phase; implementation and results will be reported at a later time.

A MODEL FOR RURAL ELDERLY HEALTH NEEDS ASSESSMENT: METHODOLOGY AND RESULTS

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ABSTRACT

Implementation of a model for assessing the health needs of the elderly living in rural areas resulted in a comprehensive community education program that sought to satisfy certain identified needs. The purpose of the rural elderly health needs assessment was to describe the actual conditions, opportunities, activities and attitudes of older citizens living in a rural area and to assess specific psychological, social and medical needs. While social and governmental interests in assessing the health needs of the rural elderly have increased dramatically in recent years, descriptions of the methodology for the assessment of those needs and services have remained rather fragmented. This model for assessing the health needs of elderly rural citizens included nine separate disciplines: sociology, social work, medicine, dentistry, occupational therapy, physical therapy, nursing, nutrition, and psychology. Survey responses were used to plan and implement a series of four workshops to improve health education in the rural community surveyed. In addition, referrals to health care and social agencies were initiated where indicated.

INTRODUCTION

This paper describes a model for assessing the health needs of elderly persons living in rural areas and a comprehensive community education program that sought to satisfy those identified needs. The purpose of the rural elderly health needs assessment was to describe the conditions, opportunities, activities and attitudes of older citizens living in a rural area and to assess specific psychological, social, medical, and health needs. Previous research has suggested that the rural elderly have lower incomes, poorer health, inferior housing and less adequate transportation systems. Social and governmental interest in assessing the health needs of the rural elderly have increased dramatically in recent years; however, descriptions of the methodology for the assessment of those needs and services have remained rather fragmented. The authors perceived a need to develop a comprehensive needs assessment methodology that could be used in diverse settings in various parts of the country.

INTERDISCIPLINARY TEAM

The model for assessing the health needs of elderly rural citizens is both structural and functional. Structurally, the model involved an interdisciplinary approach that utilized senior citizens from the target community, staff from local community service agencies, e.g., Senior Citizen's Council and Family Counseling Center, and experts from nine separate disciplines. These disciplines were sociology, social work, medicine, occupational therapy, physical therapy, nursing, nutrition, dentistry, and psychology. An interdisciplinary team, consisting of the above mentioned disciplines, was developed in an attempt to identify certain social and perceived health needs. This team was convened to develop and implement a needs assessment survey of residents over 55 years of age living in a rural community in Southeastern Georgia. The structural model is presented in Figure 1. Under the direction of a social service agency the interdisciplinary team met on a monthly basis and assumed responsibility for determining the exact geographic area in which the needs assessment would be performed.

Figure 1

Structural Design of a Model for Rural Elderly Health Needs Assessment

INTERDISCIPLINARY TEAM PROJECT

AUGUSTA COLLEGE FACULTY	MEDICAL COLLEGE OF GEORGIA FACULTY	COMMUNITY GROUPS
Sociology*	Dentistry	Social Work
Psychology	Family Medicine	CSRA Counseling Center*
	Nursing	CSRA Senior Citizens Council
	Nutrition	Family & Childrens Services
	Occupational Therapy	Hephzibah Senior Citizens
	Physical Therapy	

*Grant funding was coordinated by the CSRA Counseling Center during the first year and by the Department of Sociology, Augusta College, during the second year.

The functional aspect of the model consisted of an initial planning group that conceived of the idea and a working group which consisted of the interdisciplinary team. In addition to specifying the geographic area in which the needs assessment would be done, the interdisciplinary team functioned in an advisory capacity concerning publicity about the assessment, in identifying and locating senior citizens living in the designated areas, and in constructing an interdisciplinary survey questionnaire which represented perspectives and concerns relevant to each discipline. The interdisciplinary team also contributed to the recruitment and training of interviewers, supervised the interview process and reviewed the completed interviews. Finally, in its functional capacity, the interdisciplinary team analyzed the results of the survey, made certain conclusions in that regard, identified needs, made individual referrals, and designed and implemented a workshop series.

SURVEY INSTRUMENT

The survey instrument included sections that correspond to the interests of the various disciplines involved in the interdisciplinary team. Each discipline suggested various questions to be included in the final survey form that would pertain to their individual and professional interests. The final form included sections containing demographic information, the availability of health care, financial information, the individual's perception of his or her health status, the amount and type of interaction with others, the individual's ability to complete daily living tasks, and questions concerning life satisfaction. Many of the questions represented common interests and, therefore, there was some overlap. However, individual disciplines had their own special emphasis as shown in Table I.

TABLE I
Representative Questions in the Rural Elderly Health Needs Assessment Instrument

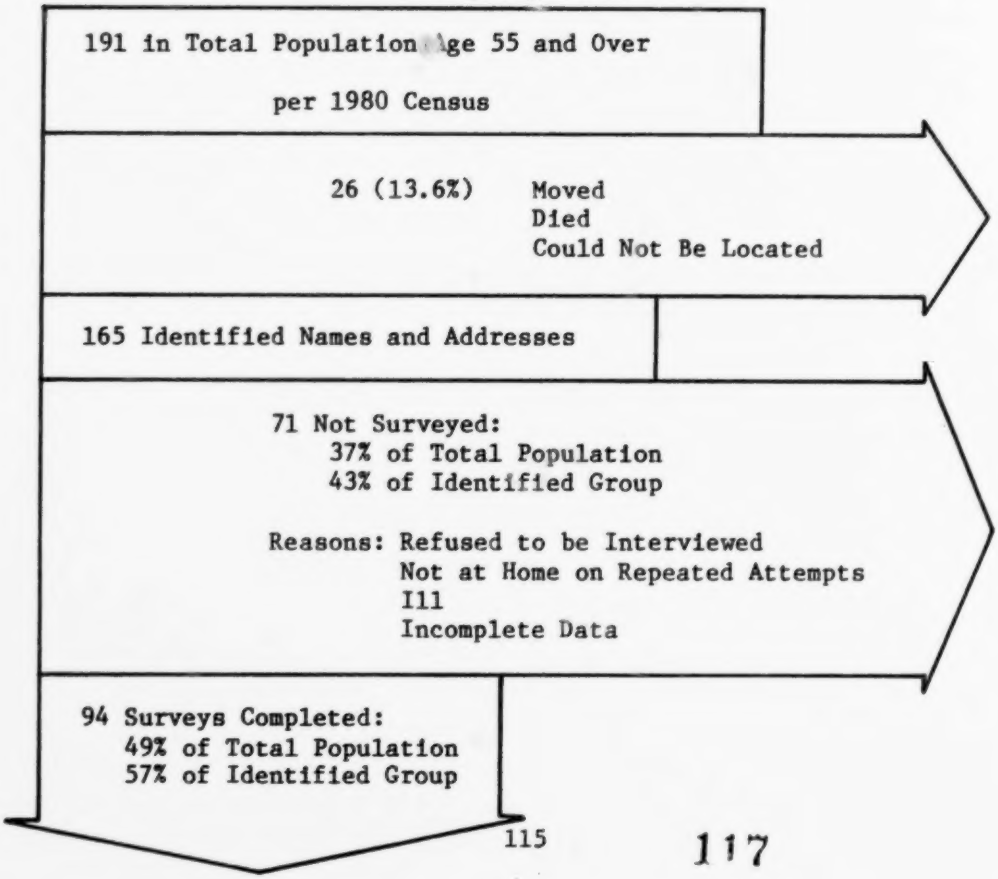
DISCIPLINE	BASIC CONCERN	REPRESENTATIVE QUESTIONS
Sociology	Demographics	With whom are you living at the present time? What is your religion? What is the highest grade in school you completed? Marital status: Number of children Past occupation
Social Work	Sources of Care	How often during the past month have you skipped a hot meal because you were unable to fix it yourself? When you need to go from one place to another how do you usually travel?
Medicine	Level of Medical Care	What is your primary source of health care? In the past year, how many times have you been to your doctor/emergency room or clinic? Have you been in the hospital in the past year?
Occupational Therapy	Life Tasks	Housekeeping and yardwork Ability to bathe and dress Kind of leisure time activities
Physical Therapy	Strength and Endurance	Get around inside and outside Walk 1/2 mile in 15 minutes Able to get as much exercise as you like
Nursing	General Health Assessment	Are you currently taking any medications? Hours of sleep
Nutrition	Type of Diet	Do you smoke? Do you drink alcohol? Are you on a special diet? Type of diet; Skipped meals
Dentistry	Dental Health	How long has it been since you have been to the dentist? Do you have artificial teeth?
Psychology	Self Concept/ Life Satisfaction	Life satisfaction questions I would like to have more attention. I would like to be alone more.

SURVEY METHODOLOGY

The 1980 census tract data indicated that there were 191 individuals age 55 years or older in the target area. A comprehensive community search resulted in names and addresses for 165 individuals and information about 26 others who had died, moved away or were unlocateable. Initially, names were obtained from local social service agencies and senior citizens' groups. These individuals were then asked to identify additional community members age 55 or over. Other names were obtained by having community members age 55 and over register for drawings of $25 gift certificates at the local grocery store and the local pharmacy. Registrants were asked to indicate whether or not they were willing to participate in the study and to suggest other residents who could be contacted by the team. The surveys were conducted by nursing students from a local college and by senior citizen community volunteers. Students from other disciplines were unable to participate due to course schedule conflicts. All surveyors completed a training and orientation course conducted by one team member. Surveyors made home visits and completed a standard survey form. Some recorded additional observations, requests for information, and referral suggestions. Each visit lasted approximately 45 minutes. Participants were asked whether or not they wished to be contacted about potentially helpful services. The surveys were collected by the team coordinator, identifying information was removed, and copies were circulated to each team member. The volunteers were able to complete 94 surveys as indicated in Figure 2.

Figure 2

Survey Population


191 in Total Population Age 55 and Over
per 1980 Census
26 (13.6%) Moved
Died
Could Not Be Located
165 Identified Names and Addresses
71 Not Surveyed:
37% of Total Population
43% of Identified Group
Reasons: Refused to be Interviewed
Not at Home on Repeated Attempts
Ill
Incomplete Data
94 Surveys Completed:
49% of Total Population
57% of Identified Group

Each member of the interdisciplinary team evaluated the survey response forms, wrote comments on summary sheets, and forwarded packets of surveys to the next team member. Evaluations were completed at the team member's convenience. Recommendations included suggested referrals to existing community services, requests for more detailed information and identification of health education needs. The team coordinator initiated follow-up referrals as the need arose. When all evaluations were completed, the team met to summarize their findings, determine community needs for general health education and suggest additional services.

RESULTS

Referrals

Health care was available in neighboring communities, but some participants indicated that they had difficulty obtaining all needed services. Follow-up referrals were made to a variety of agencies. Nursing students provided blood pressure checks and nutrition information to four participants. Other participants were referred to Senior Center programs as follows: four to TOTE (a transportation service for the elderly and handicapped), three to Meals on Wheels, three for dentures, and one each for eyeglasses, legal assistance, homemaker aide service, and RSVP (a volunteer program for retired senior citizens). Referrals to the County Department of Family and Childrens Services included six for food stamps, four for energy assistance, and one for the homemaker aid program. Two individuals were referred to the Social Security Administration and three to Medicaid. The social worker suggested homebound counseling for three individuals. The physical therapy team member identified 13 individuals and the occupational therapy team member identified 37 individuals for possible follow up or clarification of survey responses.

Demographics

A summary of selected demographic variables is included in Table II. Team members noted that 84.4% of the respoondents had lived in the community over twenty years. Most residents had low incomes. Only 6.3% of the individuals and 18.8% of the couples had yearly incomes over $15,000. Most respondents (70.8%) described their present health as fair or good, and 66.7% perceived their present health to be about the same as it had been the previous year. Most respondents were self sufficient and 72.9% lived either alone or with a spouse. Most were Baptist and had children and other relatives living nearby. Over 92% had telephones and 99% had a means of transportation. However, 23% of the respondents reported difficulty with meeting transportation needs. Many stated that they did not like to ask a relative or friend for a ride unless absolutely necessary. When asked about the amount of contact with family and friends, 68.8% thought it was about right, while 28.1% wanted more contact. Only 3.1% wanted less contact with family and friends.

TABLE II

Summary of Selected Demographic Variables

VARIABLES	PERCENTAGE	N = 94
Sex		
Male	40.6	
Female	59.4	
Age		
54-59	20.8	
60-65	29.3	
66-70	14.7	
71-75	16.6	
76-80	14.6	
81 and older	4.0	
Race		
Black	39.6	
White	59.4	
Other (Oriental)	1.0	
Marital Status		
Married	69.8	
Widowed	28.1	
Divorced	2.1	
Never Married	3.1	
Length of Residence in Richmond Co.		
10 years or less	7.3	
11 to 20 years	8.3	
21 to 40 years	21.9	
41 years or more	62.5	
Number of Living Children		
None	14.6	
1-2	31.3	
3-4	26.1	
5-8	19.9	
9 or more	8.1	
Education		
4th grade or less	22.9	
5-8 grade	22.9	
9-11 grade	20.8	
High school graduate	20.8	
Post high school	8.4	
College graduate and post college	4.2	
Income*		
Individual Yearly Income	52.2	reporting individually
Less than $3,499	18.7	
3,500-4,399	8.3	
4,400-7,499	11.5	
7,500-14,999	11.5	
More than 15,000	6.3	
Couples Yearly Income	43.8	reporting as couples
Less than $4,399	3.1	
4,400-5,499	3.1	
5,000-7,499	9.4	
7,500-14,999	10.4	
More than 15,000	18.8	

(table continues)

Table II (Continued)

VARIABLES	PERCENTAGE N = 94
Present Health	
Poor	16.7
Fair	40.6
Good	30.2
Excellent	12.5
Occupational Status	
Presently employed	48.8
Not employed	51.2
Living with	
Spouse	64.4
Children	13.5
Other relatives	12.5
Non-relatives	1.0
Alone	8.3
Religious Membership	
Baptist	69.8
Other Protestant	19.8
Catholic	3.1
Jewish	1.0
Other	4.2
None	2.0
Children near by	
Yes	69.8
No	30.2
Relatives close by	
Yes	83.3
No	16.7
Telephone	
Yes	92.7
No	7.3
Primary Means of Transportation	
Drive self	56.3
Spouse or child	22.9
Relative or friend	19.8
Walk	1.0
Amount of contact with family and friends	
Would like to see them more often	28.1
See them about the right amount	68.8
Prefer to see them less often	3.1
Difficulties with Transporation	
Often	4.2
Sometimes	18.8
Never	72.9
Not sure	4.2
Perception of Present Health as Compared to a Year Ago	
A lot worse	6.3
A little worse	15.6
About the same	66.7
A little better	10.4
A lot better	1.0

*Some married persons reported individual yearly incomes; while some married couples' incomes are duplications. Income figures given here reflected recorded responses to interview questions and are treated as a continuum.

Satisfaction

When asked, most participants were satisfied with both their leisure activities and their lives in general during the past year. Responses to the questions, "During the past year, how satisfied have you been with your life?", indicated that 54% were very satisfied, 34% moderately satisfied, and 9.6% not too satisfied. One respondent was not at all satisfied and one did not respond. When asked, "How satisfied are you with your leisure activities?", 61.7% indicated that they were very satisfied, 27.7% were moderately satisfied, 8.5% were not too satisfied, and 2.1% were not at all satisfied. The team was pleased with this high satisfaction rate and suggested additinal follow up for the 10 individuals who indicated dissatisfaction.

Leisure time activities

When asked, "What kind of activities do you do during your leisure time?", 85% of the respondents watched television, 62% visited friends or relatives, 49% read, 39% listened to music, 36% gardened, 32% baked and cooked, 18% did needlework, 10% played cards or games, 5% walked, 4% fished, and 3% worked for fun. Additional activities reported by one or two respondents were playing with their dogs, going to social clubs, volunteer work, dancing, playing the church organ, visiting the sick, and hunting. A variety of leisure time options was available in the community, but some residents requested assistance with identifying additional options and with providing additional group activities within the community. Survey analysis indicated that 17% of the respondents could benefit from a review of their leisure time status and 8% could benefit from being included in organized social activities.

Exercise

When asked whether or not they were able to get as much exercise as they liked, 53% of the respondents said "yes", 17% said "sometimes", and 30% said "no". Of these, 19% indicted that their reason for not getting enough exercise was disability or limitations from prior illness, 5% lacked enough time, and one each said it was due to age, being lazy or fatigue. The team suggested that adapted exercise programs be provided for those individuals requesting them and that the organization of a group exercise class in the community be considered. Four percent of the respondents could benefit from specific exercise programs.

Selfcare

Most participants could care for themselves, but many indicated that they had difficulty with one or more tasks, particularly climbing stairs, yardwork, and heavy housekeeping chores. Responses have been summarized in Table III. The selfcare status reported by residents of this rural Georgia community was similar to that reported in the Framingham Disability Study (Jette and Branch, 1981, and Branch and Jette, 1981). Over 95% of the residents in both studies were able to eat, bathe, dress, walk across the room, and get around the neighborhood. Framingham responses of "no problem" and "need met, potential problem" were comparable to Hephzibah responses of "no difficulty" or "some difficulty" for light housekeeping (Hephzibah 88%, Framingham 83%) and for food preparation (Hephzibah 87%, Framingham 92%). Framingham responses of percent able were comparable with Hephzibah "no difficulty" or "some difficulty" responses for heavy housework (Hephzibah 77%, Framingham 70%), climbing stairs (Hephzibah 88%, Framingham 94%), and walking 1/2 mile (Hephzibah 68%, Framingham 91%). The difference in ability to walk 1/2 mile may have been influenced by the Hephzibah survey question which asked if this could be done in 15 minutes. Many residents thought it would take them longer. Other questions on each survey form could not be directly compared.

TABLE III

Summary of Responses to Activity Questions

% RESPONSE: ACTIVITY:	No Difficulty	Some Difficulty	Use Assistance	Cannot	No Response
Getting about inside the house	81	13	5	0	1
Getting around outside the house within the neighborhood	74	19	1	3	1
Getting around outside the neighborhood	71	17	4	5	2
Climbing stairs	55	32	9	3	1
Bathing self	90	5	2	1	1
Using the toilet	93	4	1	1	1
Dressing/shoes	83	11	3	2	1
Cutting toenails	73	14	4	7	1
Preparing own food	79	7	10	3	1
Eating	97	2	0	0	1
Taking medication	91	4	3	0	1
Doing own laundry	77	10	9	4	1
Light housekeeping	77	11	5	6	1
Heavy housekeeping	48	28	7	15	2
Yardwork	40	33	6	17	2
Walk 1/2 mile in 15 minutes	38	29	1	32	1

N = 94

DISCUSSION

Based on the Hephzibah survey responses, additional follow up was suggested for the 30% of the respondents who indicated that they had difficulty with more than one daily living task. Some respondents indicated that their children helped them or that they had found alternative methods, but complete and accurate information was not always available from the survey form. For example, more information was desired about three respondents who indicated that they had skipped at least one hot meal during the past month because they had been unable to fix it themselves and did not have anyone to fix it for them. One of these respondents indicated that she was diabetic and another indicated that she was on a no salt, no sugar diet and also had difficulty with selfcare tasks. Another respondent indicated that he had difficulty eating but it was not clear whether this was due to dental problems or problems resulting from a prior stroke.

The therapists on the interdisciplinary team postulated that many area residents would benefit from a review of simplified homemaking methods and selfcare hints. Local therapists volunteered to conduct self help programs for community groups. Services to meet individual needs were identified. Some residents would need one or two visits to assess and meet specific needs and a few would need longer treatment programs. Services were available from home health agencies and outpatient programs at hospitals within the county. Even though services were available, some respondents indicated that they needed assistance with obtaining therapy services and with coordinating transportation to and from the hospital.

WORKSHOP SERIES

After all of the surveys were reviewed, the team planned a series of four community workshops to be conducted during the following year. Speakers included team members and local health professionals. Topic choice was based on perceived needs and comments from the surveyors. Each workshop emphasized topics of general interest and a common sense approach. The workshops were held in the town hall on a weeknight that did not conflict with local church activities. The 7:00 p.m. to 9:00 p.m. time was chosen so that senior citizens could get a ride from family members who worked during the day and still return home relatively early. Two workshops were held during the fall and two during spring to avoid bad weather. The series was advertised at the local fair and invitations were mailed to each survey respondent. Refreshments and door prizes were provided to encourage attendance.

The first workshop provided information about Medicare and Social Security benefits and procedures as well as information about local service agencies. Respondents had indicated that they had difficulty filling out forms and obtaining payment for healthcare. The second workshop was held in November and dealt with ways to keep warm in the winter. Survey responses indicated that many participants were concerned about fuel bills. Also, a large percentage of patients in a local burn unit were elderly. This workshop included a slide tape about energy conservation provided by a local utility company, a slide program about burn prevention provided by a local hospital's burn unit, and a review of hints about dressing for warmth. Workshop participants also shared their hints about ways to keep warm in the winter. The third workshop was held in March and titled "Keeping Fit in the 80's". Emphasis was placed on promoting a healthy lifestyle. Presentations included slides about home safety, a review and handouts about good nutrition, and a demonstration and practice of specific exercises for senior citizens. The final workshop was held in May. The program consisted of a review of medical terminology by one team member, an explanation of dental terms by the local dentist, and information about terms and precautions relating to medications by the local pharmacist. Speakers then answered questions from the participants about terminology, how to ask for information, and how to find health care.

Each workshop was attended by approximately twenty senior citizens and family members. The participants expressed satisfaction that health professionals would come to their community, indicated interest in the topics presented, and asked speakers to repeat the presentations for other community groups. Several asked about the possibility of monthly programs.

SUMMARY

This model provides one effective method by which health professionals from different disciplines and agencies can assess health needs of the elderly in rural communities, provide individual referrals for service, and conduct commmunity health awareness programs. The planning group and interdisciplinary team held monthly lunch meetings during a three year period. Other activities were completed by team members and community volunteers at times convenient to them. Funding was obtained from the Area Agency on Aging for meeting expenses and student travel needed to complete the surveys. All other services were donated by the team members.

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COST CONTAINMENT STRATEGIES FOR THE LABORATORY AND THEIR EFFECT ON SAMPLE VOLUME

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ABSTRACT

The introduction of new federal cost control programs, diagnostic related groups (DRG's) in particular, have changed the reimbursement system for hospitals. Under this new system, many of the revenue producing services for the hospital have changed to cost centers. Of these services, the laboratory in particular, has been the focus of many administrators. In an attempt to reduce costs, many administrators have directed laboratories to consider discrete analyzers in place of their continuous flow profiling analyzers when making new purchases, and they have also encouraged changes in ordering protocol.

This study evaluated a 350 bed primary care facility which implemented such strategies. While the institution was trying to reduce the number of tests per sample to bring about cost reductions, we questioned if the medical staff would increase the number of samples to gain back information previously provided by a 20 chemistry profile.

The data revealed that sample volume increased 34% which, in turn, has increased the institution's costs due to the additional labor and material associated with the corresponding additional venipunctures.

INTRODUCTION

One of the major issues that health care facilities are faced with today is cost containment. The catalyst to this issue was the implementation of federal cost containment regulations in 1982, which created the program now known as the Diagnostic Related Groups (DRG's). The introduction of DRG's have changed the reimbursement system for hospitals. Under this reimbursement system, support services such as radiology and laboratory no longer function as revenue producers, but are now regarded as cost centers. Because of this, many have focused their attention on these services in their institutions cost containment efforts. Of these two support services, the laboratory has been the main target. This focus of attention comes about for two reasons. The first being that the laboratory is the most widely used support area, and secondly, because government, third party payers, and the public have been subjected to substantial laboratory charges. These charges have caused many to view the laboratory as one of the major contributors to rising health care costs. Although many realize that laboratory charges do not reflect true laboratory costs, most would be surprised at the real cost of their laboratory test. For example, the average charge for a glucose assay is about $8.00, while the true cost is about 25 cents. However, under the new DRG structure, hospital administrators have urged laboratories to reduce costs. Most have approached this task by isolating and reducing the high volume tests now being ordered by physicians. These high volume tests are those found on most profiles, and generally, make up more than 60% of tests performed in a chemistry laboratory (1,2). This approach has been taken for a number of reasons, the main one's being that many feel that physicians overutilize and rely far too much on laboratory tests. The continuous flow analyzers of the 60's, 70's and 80's offered no single or smaller multiples of the tests found on the profiles they were programed to perform. The continuous flow analyzers cause reagent waste and produced false abnormals, which in turn, caused physicians to order additional tests.

On the other hand, proponents of chemistry profiles suggest that profile testing leads to early detection of disease, shorter hospital stays, and if used properly, can reduce the reliance of more expensive tests, such as iso-enzymes. In addition, high throughput profiling analyzers are the most cost effective analyzers for facilities with high volume and a large number of tests ordered per sample.

However, many high and low volume facilities which have profiling continuous flow analyzers have implemented one or all of the following changes to bring about cost savings:

1) They have changed their continuous flow analyzers to discrete analyzers.
2) Reduced the number of profiles a physician is permitted to order.
3) Reduced the number of tests physicians were permitted to order on each sample.

Overall, institutions have tried to reduce the dependency that physicians have on the laboratory. A point should be made here that most are trying to reduce the number of tests per sample and necessarily the number of samples. While institutions are trying to reduce the number of tests per sample to bring about cost savings, we questioned if the medical staff would increase the number of blood samples to gain back the information previously provided by the profile.

METHOD

The present study was conducted at a 350 bed primary care facility in suburban New York, which routinely offered a 20 chemistry profile to their medical staff. In early 1984, the institution changed its instrumentation from a profiling continuous flow analyzer to a discrete analyzer and implemented new ordering protocols designed to reduce costs. These protocols identified which assays would be performed and when. For example, the medical staff was only permitted one 20 chemistry profile upon admission. During all other times, they were limited to single or small multiples of tests. This raises the possibility that sample volume will be increased as physicians attempt to obtain additional information. To evaluate if physicians were increasing their samples to gain back the profile information, we reviewed laboratory requisitions for two one-month periods. The first month's requisitions were obtained when the institution offered the 20 chemistry profile with no restrictions. The second month's requisitions were obtained six months after the institution changed their ordering protocols and chemistry analyzer.

RESULTS AND DISCUSSION

After adjusting for changes in occupancy differences, the data revealed that sample volume increased 34% when the new protocols and discrete analyzer were implemented. This indicated that most physicians were ordering additional tests, possibly so that they may retrieve the same information that they gained from the profile. This increased sample volume surely has increased the institutions's costs due to the additional labor and material associated with corresponding venipunctures.

If one considers workload units developed by the College of American Pathologists (3), the eight workload units for each venipuncture far exceeds the 2.5 units for a 20 chemistry profile performed by the continuous flow analyzer. In fact, it takes less work to perform three 20 chemistry profiles than one venipuncture. In addition, this approach restricts information, as it has been shown that groups of tests offer more information than single or small multiples (4). Furthermore, for most of the chemistry analyzers today, the bulk of the cost and labor is in sample preparation. Once the sample has been placed on a high throughput analyzer, the actual number of tests requested generally influences the cost very little.

To reduce the number of tests per sample or to only offer small multiples, seems to only increase overall testing volume, as demonstrated in this study. This increase in sample volume, in turn, increases the laboratory and hospital workload, along with limiting the amount of information a physician can obtain at one particular time. This restriction could possibly increase the patient's length of stay and produce a cost far more intensive than routine laboratory testing. There is, no doubt, that the laboratory has become an intrinsic part of a physician's approach to health care delivery. To simply change laboratory technology and protocol will not work as demonstrated by this study.

Two of the authors, Lehmann and Leiken, have demonstrated the relationship of laboratory costs to ordering strategies and laboratory technology (5,6,7). All three of these studies have evaluated costs associated with discrete vs. continuous flow analyzers. The most recent study monitored the same physicians as they rotated through two different facilities, evaluating the same diagnostic codes. One facility utilized a continuous flow analyzer that offered a 20 chemistry profile, and the other utilized a discrete analyzer and discouraged the ordering of large profiles. The data revealed that the physicians ordered as many profiles at the facility with the discrete analyzer, and because of their technology, this facility encountered greater costs (7).

In general, costs can be isolated and dealt with for each division of our health care system or as an accumulation and interaction of all. Many administrators, in particular laboratory administrators, in an attempt to reduce costs, have isolated themselves and their approach to cost containment, without realizing the effect it might have on their health care counterparts both physically and economically. The concept "team approach" is an important approach in health care delivery and should be just as important in assessing cost containment strategies. In the "team approach" concept, it does not make sense to restrict the amount of contribution any one contributor can make, without first evaluating the impact it might have on the overall efficiency

However, this seems to be the approach that many have taken in dealing with cost containment. A more holistic approach to cost containment would be to improve interactions between health care workers in order to incorporate everyone's expertise into a cost containment plan. If the laboratory is to be the target, both laboratorians and practitioners together should evaluate such factors as case mix, laboratory utilization, appropriate testing patterns, and technology. Appointing key laboratory personnel to aid practitioners in their choice of laboratory tests could prove to be educational, as well as cost effective.

CONCLUSION

The data clearly demonstrates that the facility studied encountered increased sample volume along with increased workload. It seems from this study and others that a physician's approach to the laboratory is not influenced by technology or laboratory protocol.

If hospital and laboratory administrators' goals are to increase productivity and decrease costs, as attempted in this study, they must begin to change their approach. Isolated approaches to such a complex issue can prove counterproductive. Adopting a more holistic approach would seem to be more eventful. This approach might identify the best ordering strategies for a facility's case mix, along with the most cost effective technology.

Under this new federal legislation, it seems that those facilities who increase productivity and minimize length of stay will receive the greatest financial gains.

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RESPONDING TO THE CHALLENGES OF TOMORROW: CHANGES IN THE DISSEMINATION OF CLINICAL INFORMATION

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ABSTRACT

Numerous authors speak of the need for all educators to prepare their students to meet the challenges of the information age. The question arises as to how educators of allied health professionals can best prepare their students to meet the challenges of tomorrow.

In a sense, the clinician is an information manager who must disseminate information regarding individual patient history and clinical course, diagnostic and therapeutic protocols, disease patterns, the functioning of the health care system, and the vast store of published knowledge. A review of the scholarly literature in the field of allied health, medicine, education, journalism, and information science indicated during the twenty-first century the application of computer information services will be vital to the successful acquisition, analysis, retention, utilization, and transfer of clinical information. Conclusions indicated a high need for allied health professionals of the future to be able to utilize computer communications technology within a clinical setting.

INTRODUCTION

A review of the literature in the fields of medicine, allied health, and nursing, indicates a need for health care educators to prepare students and practitioners to combat the destabilizing effects of the information explosion (1,2,3). The question arises as to how the information explosion has affected the allied medical professions and how educators can prepare students and practitioners to effectively manage clinical information.

Indeed, effective information management is a critical component of the delivery of clinical services. There are very few health care professionals who are not involved in some aspect of the process of information dissemation (4). The delivery of clinical services is very dependent upon the successful acquisition, analysis, retention, utilization, and transfer of information (5). In a sense, the allied health professional is an information manager who must disseminate information regarding a) individual patient history and clinical course, b) diagnostic and therapeutic protocols, c) disease patterns in patient population, d) functioning of the health care system, and e) published knowledge (6).

COMPUTER NETWORKS

Unfortunately, our ability to generate clinical data far surpasses our ability to acquire, analyze, retain, utilize, and transfer this information. The effects of the information explosion manifest themselves in several ways, ranging from unnecessary actions and tests related to patient care, to break downs in the flow of information within health care organizations, to difficulties of allied health students to disseminate all of the necessary information.

Because of the rapid and constant growth of clinical literature, the vast array of investigations and therapy, and the increasing number of diagnoses, it is very difficult for a clinician to keep abreast of his/her own specialty, let alone the entire field of medicine (7). According to Gremy, there are over 3,000 diseases and symptoms, more than 200,000 words or expressions in the medical vocabulary, and approximately 10,000 pharmaceutical preparations (8).

The application of computer technology to the allied health professions offers significant potential for harnessing the vast amounts of clinical information, and reducing the gap between existing knowledge, and its application to clinical settings. Numerous authors speak of the fact that technology brings order to the deluge of clinical information and gives value to date that otherwise would be meaningless (9,10,11).

Computer information networks join together mainframe and microcomputers via high speed transmission lines. Networks uusally contain specialized databases, bulletin boards for message postings, mechanisms for sending and receiving electronic mail, and teleconferencing capabilities.

Networks augment automation of medical records, hospital management, diagnostic decision-making, dissemination of drug information and disease information, electronic mail, literature searches, and interpersonal communications. Use of databases significantly expand the scope of a clinician's research abilities and significantly reduce the time-frame associated with this activity.

Via the mode of communications, allied health professionals can obtain instantaneous information regarding a disease alert, take a continuing medical education course, participate in a teleconference, exchange software with other practitioners, or communicate with geographically dispersed peers.

One of the prime advantages of using networks is the ability to build and maintain human relationships. Not only is this a convenient and cost-effective method of keeping in touch with geographically dispersed peers, this method of communications also has the capability to significantly expand the human resources which one has access to (12).

Perhaps the area of the most far-reaching consequences is the application of artificial intelligence to disease diagnosis. Through dissemination of highly sophisticated branching logic, a database of disease information, and individual patient information the clinician is provided with a diagnosis. Through the linkage provided by computer information networks, future clinicians will have access to artificial intelligence systems which otherwise would be too costly for purchase by a vast majority of health care institutions (13).

The American Association for Medical Systems and Informatics (AAMSI) has been instrumental in advancing the application of computer information networks to health care. This organization is comprised of fifty specialty interest groups relating to the application of technology to specific health care areas. Emphasis is placed upon the use of systems, computer technology, and telecommunications to improve direct patient care. Specialty interest groups related to allied health include occupational health information systems; computerized medical records; radiology, image and signal processing, ECG, EEG, ultrasound; physical therapy information systems; medical dietetics; anesthesiology information support systems; health marketing; and self-care health systems.

AAMSI also has an electronic medical forum available on CompuServe, a major computer information service. This forum contains mechanisms for obtaining research files and message postings concerning issues ranging from health promotion and disease prevention, to the latest FDA announcements, an online medical reference source for laymen, a rare disease database, etc. Within this forum it is not uncommon to see health care practitioners exchanging information concerning patient care.

Despite the lifesaving potential which communications technology holds, the medical community has been reluctant to adopt this form of information dissemination (14). This can be attributed to a number of factors, ranging from lack of exposure to computers, lack of awareness of the capabilities of technology, and lack of access to hardware, to more complex issues such as problems associated with retrieval quality, inadequate linkage among databases, and the need to rely on trained intermediaries (15). This suggests a need for formal training of students and health care practitioners concerning the effective use of computer information services.

EDUCATING HEALTH PROFESSIONALS IN COMPUTER SCIENCE

Presently, a number of American and European universities have begun integrating computer science study into the health science curriculum. The term, medical informatics, is often applied to the field of study concerned with the application of computer technology to medicine. Van Brunt defines medical informatics as "the application of computer and information technology and systems to all fields of medicine-to medical care, education, and research" (16).

Many authors advocate the introduction of medical informatics into the health science curriculum (17,18,19). An ongoing study of medical education by the American Association of Medical Colleges has identified medical information science as a key area for curriculum development (20). The study recommended the establishment of additional medical information science training programs with special curricula and graduate degrees.

Unfortunately, none of the medical informatics curriculums discussed in the literature directly addresses the issue of the training necessary for allied health students and practitioners to effectively use computer information networks. Thus, there is a need to establish competency levels for training students and practitioners to use this method of information dissemination. Anderson, Gremy, and Pages developed criteria (Table I) for the training of students and practitioners in medical informatics and afforded a basic structure for the design of these competency levels (21).

TABLE I

Criteria for Computer Informatics Training

Level One:
Provides a general knowledge of the application of computer information services to medicine.

Level Two:
Trains practitioners to participate in the design and implementation of computer projects.

Level Three:
Trains practitioners to be specialists in medicine and computers. They will design and implement systems.

As the reader will note, these criteria provide for structured progression of learning from the very basic to specialization in computers and informatics in health care and education. At Level One all health care practitioners are provided with a general knowledge of computers and data processing.

Doctors, nurses, allied health professionals and administrators who progress to Level Two are trained to cooperate more effectively with experts in data processing, and to participate in the design and implementation of computer projects.

Level Three provides extensive training for health care practitioners who would like to spend the majority of their time being involved in computing and data processing. They will have training both in medicine and computer science and be specialists in both areas. They will primarily be involved in the development and implementation of new computer systems.

The Anderson, Pages, and Gremy criteria served as a basis for defining skills and competency levels for educating allied health students and practitioners to optimally use computer information (Table II).

TABLE II

Skills and Competency Levels

Level One:
Provides practitioners with a general knowledge of computers and data processing.

Level Two:
Provides training to:
a. teach Level One
b. serve as content advisors
c. experiment with networks
d. conduct needs assessment
e. organize conferences/teleconferences.

Level Three:
Provide training to:
a. serve as system managers
b. develop networks
c. design needs assessment
d. conduct research

Following is a delineation of skills included at each level of training.

Level One provides all health care students and practitioners with a general knowledge of the application of computer information services to medicine. This would include recognizing the similarities and differences of the various types of information systems, practical experience searching bibliographic databases, an awareness of CED and teleconferencing applications, awareness of local area health networks and networks devoted to specific aspects of medicine, a knowledge of the hardware and software considerations germaine to specific applications, competency oriented tasks of selecting information providers and electronically obtaining information.

Level Two provides allied health students and practitioners with the training necessary to execute the following: the ability to teach Level One competency skills to undergraduate students and health care practitioners, the ability to determine needs assessments when integrating networks into clinical settings, serve as content advisors to computer information networks, including bibliographic databases, obtain grants for projects focusing upon the experimental use of computer information networks within classroom and clinical settings, serve as advisors to health care institutions and organizations concerning this matter, participate in and organize national conferences and teleconferences concerning the application of computer information networks to specific areas of clinical service.

Level Three provides allied health students and practitioners with the training necessary to execute the following: serve as systems operators or managers of health information networks or the medical components of general information networks, develop and implement local area and specialty interest networks, design needs assessment protocols, oversee the development of learning resources for user-training, conduct research concerning: information needs of specific clinical specialties, characteristics of early adaptors of technology, the effects of use of computer information networks on the delivery of health care services, patient care, and cost-containment.

Further research is needed concerning the design of curriculum appropriate for training students and practitioners to effectively execute Level One, Two, and Three tasks.

CONCLUSION

In conclusion, it is the belief of this author that the process of educating allied health professionals to adapt to changes in the dissemination of clinical information must take into account training students and practitioners to effectively utilize computer information networks. A bibliography for further reading is given in Appendix H.

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POSTER SESSIONS

Seven poster sessions were given to briefly present a variety of research studies:

Evaluation of a procedure for testing antibodies

Evaluation of an assay for antibodies

Substance abuse among nurse anesthetists

Occupational therapy for children with Down's Syndrome

Platelet utilization review

Effects of inhaled diesel exhaust

Lymphocytotoxic antibodies in bone marrow transplant patients

EVALUATION OF PRE-TREATMENT FIXATION ON THE INDIRECT AVIDIN-BIOTIN IMMUNOFLUORESCENCE TEST FOR PLATELET ANTIBODIES

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INTRODUCTION

Component theory for the thrombocytopenic patient is now commonplace in modern practice. Patients with transient thrombocytopenia from treatment regimens for malignancy constitute the largest patient class receiving platelet transfusions.(1) Long term support of patients with platelet transfusions causes 70% to develop a refractory state. Prevention of alloimmunization to the HLA antigens has been proposed by the application of leukocyte depleted products and by a matched donor protocol from the beginning of any transfusion needs. Controversy exists as to whether these measures would allay onset of the refractory state.(2)

No standard method is available for platelet crossmatching or antibody screening and the reasons are complex.(3) Of the many problems existent, one is platelet storage for a "panel" of donors. The procedures of aliquoting, cryopreservation (if any) and recovery/preparation for assay is a very labor intensive proposition, whatever the assay employed. Of the reported procedures, many cite the use of fixatives in pre-treatment of the platelet.(4) The desirable effects of paraformaldehyde (PFA) fixation was initially reported for the platelet immunofluorescence test (PIFT).(5) The cited benefit of fixation was a reduction of nonspecific reactivity of the platelet. The presumed effects of PFA was a diminution of the platelet's nonspecific binding competence for the Fc region of AHG-FITC or other immunoglobulins. This investigation examines the effects of fixation of the specificity and sensitivity of the indirect avidin-biotin immunofluorescence assay.

MATERIALS AND METHODS

The fixation techniques for pre-treatment of the platelets were applied to air dried platelet preparations. The time of fixation was held at 15 minutes and concentrations of the fixative were varied. Employed were glutaraldehyde (GHA) at 0.5% and 1.0%, paraformaldehyde (PFA) at 1.0%, 2.0% and 5.0%, 10.0% neutral buffered formalin (NBF) and ethanol:acetone 1:1. The slides were codified to disguise their pre-treatment and to reduce or eliminate bias in reading. A single platelet donor was used with three selected sera known to be reactive. Slides were examined under the oil immersion lens of an American Optical fluorescent microscope of an epi-fluoro-lume type with appropriate filters for the excitation of fluorescein. Reaction grading was accomplished by assignment of weak (20%), moderate (20-60%) and strong (>60%) fluorescence positive platelets on a given preparation and by titration of the sera.

Effects of fixation were evaluated by an autologous control, a reagent control and three selected sera. The specificities of the sera were: ABO compatible anti-HLA A1 + Pl^{A1}, anti-Pl^{A1} and ABO incompatible anti-sera. Reactivity was evaluated with a single donor platelet source known to be antigen positive. PFA did not diminish titer of reactivity; although 5.0% PFA and 10.0% NBF gave high background fluorescence. ETOH:acetone also did not diminish titer of reactivity but gave difficulties in reading similar to the higher concentrations of formaldehyde. GHA proved unacceptable as a fixative at the concentrations tested, giving positive fluorescence in the autologous and reagent controls.

RESULTS AND DISCUSSION

We found PFA to be satisfactory for the avidin-biotin immunoassay, with comparable results to air dried platelets. Difficulties in interpretation were found with 10% NBF and ETOH:acetone 1:1 because of positive autocontrols in some staining runs. GHA proved unacceptable because of consistently positive autocontrols.

The results of this investigation shows no detectable change in titer of reactivity with PFA pre-treatment. Specificity was unchanged for the three sera tested. This immunohistologic staining method for platelet antibodies proved to be relatively quick and easy to perform. This assay offers the advantage of using small quantities of platelets and patient sera. Although no change in antigenicity was found with up to two weeks storage at 4 C, it remains to be seen how long the patient antigens can be maintained on glass slides and what storage conditions may prove optimal.

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EVALUATION OF AN INDIRECT AVIDIN-BIOTIN COMPLEX IMMUNOFLUORESCENT ASSAY FOR PLATELET ANTIBODIES

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The prevention and treatment of hemorrhage in patients with severe thrombocytopenia has been greatly enhanced with advances in platelet transfusion therapy. However, multiple exposures to foreign antigens through repeated transfusions and multiple pregnancies may lead to alloimmunization of the patient. Multiple transfusions hve been shown to lead to a refractory state in which poor platelet increments occur after transfusion.(1) Early studies indicated correlation with HLA matching in these platelet refractory patients (2); however, not all patients responded to HLA matched platelets. Recent data (3) have correlated failure to achieve good platelet increments in some patients to the presence of circulating antibody directed against non-HLA antigens of the platelet. However, most assays using platelets as target cells use time consuming and highly sophisticated techniques and/or potentially hazardous reagents (4,5). Employing an indirect immunofluorescence assay with an avidin-biotin complex (ABC) we have developed a highly sensitive and specific technique (F-ABC) for the detection of platelet antibody.

Briefly, donor platelets are air-dried on microscope slides and incubated with undiluted patient serum. After three 5 minute washes in PBS (pH 7.4), the platelets are sequentially incubated with previously titered biotinylated rabbit anti-human IgG and an avidin-FITC complex with each incubation followed by three 5 minute washes in PBS (pH 7.4). Prepared slides are examined for fluorescence in a Zeiss epifluorescent microscope under oil immersion (100X). Sera are scored on the number of platelets exhibiting a stippled staining pattern of the apple-green fluorescence characteristic of fluorescein isothiocyanate. Scores are recorded on a 0 to 4+ rating with 2+ being 50% of 200 platelets stained and 4+ being >90% stained.

Donor sera for normal controls were selected from individuals who had donated lymphocytes to the HLA laboratory. Patient sera were selected from stored samples which had been previously tested by at least one reference laboratory.

Thirty-one known positive and negative patient sera were tested. The F-ABC technique agreed with 93.6% of the reference laboratory results. A two by two table was constructed and the sensitivity was calculated to be 100%, assuming the reference methods to be true positives, and the specificity was 85%. Parallel testing of both donor and patient sera by lymphocytotoxicity revealed no correlation with either positives or negatives by F-ABC. Two control donors gave repeatable weak positives. Both donors were female, one of which had had two pregnancies; the other was nulliparous.

With its four binding sites and high affinity ($KD = 10^{-15} M^{-1}$) for biotin, fluorescein labeled avidin when coupled with the biotinylated secondary antibody greatly amplifies the indirect immunofluorescent assay. The data demonstrate also that results were consistent and reproducible with high sensitivity and specificity. This assay has not yielded false negatives on any patient sera tested. To date, only two healthy control sera have given weak false positive scores. These false positive scores may be the result of high background immunofluorescence as alternative assays have not shown the presence of antiplatelet antibodies in these individuals.

The use of HLA-matching alone has been shown to be insufficient in predicting transfusion success in refractory patients. Others have shown high correlation with other platelet crossmatching techniques. However, the techniques reported are generally technically difficult, use fresh platelets, or are too time consuming for routine use. We feel that this assay has potential for widespread application in platelet antibody testing.

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CRITICAL FACTORS ASSOCIATED WITH SUBSTANCE ABUSE AND CHEMICAL DEPENDENCY AMONG NURSE ANESTHETISTS

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A survey was conducted to identify characteristics associated with chemical dependency among chemically dependent nurse anesthetists. The survey investigated the employment setting, educational background, drug history and suicidal behavior.

The major findings revealed that the chemically dependent nurse anesthetist is not unlike other chemically dependent individuals. This study revealed 71% of the subjects had a family history of chemical dependency. There was a 28% incidence of suicide attempts among the subjects. Seventy six percent of the subjects reported administering anesthesia while under the influence of chemicals, though no one was reported injured. Other characteristics identified were: used drugs for recreation as well as a coping mechanism; were chemically dependent from 1 to 10 years; have been drug free from 1 to 10 years; were in the top third of their anesthesia class; were employed in larger hospitals; used alcohol as the drug of choice; required a confrontation before entering treatment; encountered few legal difficulties; experienced some difficulty with re-entry to practice; were members of the professional organization; and currently attend some form of support group. This study affirms the need for developing educational and employee assistance programs.

OCCUPATIONAL THERAPY INTERVENTION WITH DOWN'S SYNDROME CHILDREN: A PILOT STUDY

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INTRODUCTION

The purpose of this collaborative pilot study was to examine the effects of an occupational therapy program on the development of five children with Down's syndrome.

Agencies participating in the project included a Child Development Center where the children were enrolled, a community supported out-patient Rehabilitation Center, and the Department of Occupational Therapy, Medical College of Georgia.

Senior occupational therapy students, under the supervision of therapists at the Rehabilitation Center provided programming for the children. A small research grant from the School of Allied Health Sciences, Medical College of Georgia, assisted the students with travel costs and the cost of supplies.

BACKGROUND

Typically, Down's syndrome children are delayed in gross and fine motor development, language and cognition. They may have difficulty keeping their tongues in their mouths; balance is poor during the early years, and they have generalized low muscle tone which contributes to their awkwardness and delays in mobility, speech and hand skill development. Because of resultant altered sensory integration, they may also have problems with attention, concentration and eye contact.

Experience has shown that proper handling and systematic approaches to motor, sensory and task skill programming can have a positive effect upon the developmental level and functioning of such children, given the limitations of their disability.

RESEARCH QUESTION

Can the developmental and functional levels of a sample population of Down's syndrome children be measurably altered through a planned program of occupational therapy intervention?

POPULATION

Five children, ages two to five years, with a diagnosis of Down's syndrome served as the population for this study.

METHODOLOGY

An experimental design was utilized for this study. The instrument used for initial evaluation (Pre-test) was also utilized to measure the results of the intervention (Post-test).

PROCEDURE

Each subject was evaluated with either the Early Learning Accomplishment Profile for Developmentally Young Children (E-LAP) or the Learning Accomplishment Profile (LAP). These instruments utilize generally accepted developmental norms and milestones as the basis for assessing skill areas.

Based on the findings of the initial assessment, at least two goals were established for each subject; e.g., gross motor, fine motor, cognitive, self-help. Program plans were developed for each subject based on the goals established. Methods, procedures and activities included neurodevelopmental/sensory integrative techniques, sensory integrative modalities and activities.

Each subject was provided occupational therapy programming at the Center three times a week for one-half hour each time. Programs were provided for three months.

Measurements utilizing the same instruments as in the initial assessments were taken at the end of the three months. An increase of six months in developmental performance level was considered clinically significant.

RESULTS

Three of the subjects (#1, #2, and #4) demonstrated clinically significant gains in gross motor skills ranging from four to 12 months beyond the six month significance level.

All of the subjects except Subject #5 demonstrated clinically significant gains in fine motor skills; one subject scored exactly at six months (increase), two scored an additional month and Subject #1 exceeded the six month significance level by four months. Although Subject #5 showed a minimal gain (two months) in fine motor skills, this subject showed a seven month gain in self-help skills, some of which have fine motor components. Subject #3 and #4 also showed significant gains in pre-writing skills.

All subjects except Subject #5 showed significant gains in cognitive skills, particularly Subjects #3 and #4, who gained a year in this area. Subjects #3 and #4 demonstrated similar gains in language skills as did Subject #2.

With the exception of Subject #2, all the subjects demonstrated significant gains in self-help skills ranging from a total increase of eight to 17 months.

All subjects demonstrated significant increases in social emotional or personal social skills; the least being Subject #2 (six months), the greatest, Subject #1 (19 months).

PLATELET UTILIZATION REVIEW: A RATIONAL APPROACH

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Platelet transfusions have increased dramatically during the past ten years, nationally as well as locally. During 1983, platelet transfusions exceeded those of red blood cells in The Ohio State University Hospitals. We found that 70% of the Platelet Concentrates went to the 20% of patients who received >10 platelet transfusion (>100 units). We decided, with the approval of the Transfusion Committee, to establish a multidisciplinary committee to review platelet transfusions and make recommendations to the responsible physicians about further management of their patients.

The members of the Platelet Utilization Review Committee included the supervisor and shift supervisors of the crossmatch laboratory, the HLA laboratory supervisor, the resident, fellow and director of the Transfusion Service of The Ohio State University Hospitals; the supervisor and assistant supervisor of the HLA laboratory, the head nurse and staff nurse of the pheresis department, and the medical director of the Central Ohio Regional Red Cross Blood Center.

All patients receiving platelet concentrates were recorded and those receiving >10 platelet concentrate pools (transfusions) were reviewed. Parameters reviewed included patient diagnosis and serious clinical problems, number of platelet concentrates transfused, number of plateletpheresis products transfused, HLA type, HLA antibody screen, and recent pre- and post-transfusion platelet counts. For some patients, corrected platelet count increments were calculated to determine if the patient had the expected increase in platelet count after transfusion (Theil 1984). Committee recommendations were called to the patient's house staff physician by the Transfusion Service resident or fellow.

RESULTS

Data from January-April 1984, before the Committee was formed in July 1984, was compared to the same period in 1985. Usage of random donor platelet concentrates and single donor plateletpheresis products, patients receiving >10 pools and the number of HLA alloimmunized patients all decreased (Table I).

TABLE I
Comparison of Selected Statistics

	Jan-Apr. 1984	Jan-Apr. 1985
Platelet Concentrates transfused	13,290	8,706
Plateletphereses transfused	160	105
Patients receiving >10 pools	48	9
Patients HLA antibody screened	23	23
Patients HLA antibody positive	12	7

The proportion of patients receiving 10 pools decreased from 20% to 4% and the proportion of single donor platelet concentrates remained at 12% of transfusions. The number of patients screened for HLA antibodies remained the same. However, alloimmunized patients (positive HLA antibody screen and poor platelet increments after transfusion) decreased from 5% to 3% of platelet recipients.

Because of the data on platelet increments generated by the Committee and comparisons of random donor platelet pools and plateletpheresis products, recommendations were made to the medical staff and house staff to change the standard platelet pool from 10 units of random donor platelet concentrates to 8 units. This was successful, where previous attempts had been unsuccessful.

CONCLUSIONS

Platelet usage was decreased by the activities of the Committee, both by number of units per patient and the number of units per transfusion. The number of alloimmunized patients decreased with no increase in the number of patients HLA antibody screened. The Platelet Utilization Review Committee is an effective and efficient way of changing transfusion practices.

REFERENCE

Theil KS, Kennedy MS: Corrected count increment: a measure to detect platelet alloimmunization. Diagnostic Medicine 7(6):8-12, 1984.

ANALYSIS OF THE EFFECTS OF INHALED DIESEL EXHAUST ON THE ALVEOLAR INTRAVASCULAR AND INTERSTITIAL CELLULAR COMPONENTS OF RODENT LUNGS*

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This project is an example of collaborative research on an environmental health problem. The investigative team, a Medical Technologist (analyzer and principal author), a Chemical Engineer (developer of the computer programs for the primary and present study; investigator in the primary study) and a Physiologist (Director of the Bargman Research Laboratory, primary investigator of first studies and director of this present project), expanded part of a systematic long-term morphologic study on the pulmonary effects of the environmental pollutant, diesel engine exhaust, on rodents.

BACKGROUND

The availability of effective fuel has always been of major concern to the industrial world. With the advent of the diesel engine, this type of propulsive power plant has proven to be more efficient than most other types producing lower emission of some of the gaseous pollutants. However, because the number of diesel cars and particularly diesel trucks has increased, more particulate matter exists in the atmosphere we breathe. Various studies have demonstrated that some of the fractions of diesel exhaust are carcinogenic, mutagenic and immunodepressant. Concern regarding these effects have brought about exhaustive studies determining the fractions of diesel exhaust and their effects upon the lungs.

The early studies carried out by the Bargman Research Laboratory on the effect of DE exhaust on the lung tissue of rodents revealed no pathology or neoplasm, but there was evidence of classic signs of inflammation with an increase of granulocytic and monocytic cells in both the air spaces and in the interstitum of exposed lungs. These earlier studies did not differentiate either the vascular or interstitial cells in terms of their morphologic type. Such information is essential for an understanding of the lung's capability to respond to an inhalation stressor such as DE.

An extensive micrograph data base for an entire two-year DE exposure study was already available and provided an opportunity and the necessary material for the additional cellular differentiation study. We chose to analyze further a few of the extreme exposure groups as most likely to provide data that might illustrate statistically significant cellular differences from the age-matched control groups. We selected for further analysis the responses of Fischer rats over short-term (2-10 weeks) exposures to 6000 g DE/M^3 versus an 18 month exposure to 1500 g DE/M^3. In addition, we were interested in determining if there was a species sensitivity in these DE responses of Hartley Guinea Pigs exposed for 18 months to 1500 g DE/M^3 for comparison with similarly exposed rats.

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*This study was supported in part by earlier funding from the General Motors Corporation and continued support from the Bargman Foundation Laboratory for Cell and Molecular Research.

METHODOLOGY

For this extended study to identify the cellular components of the alveolar capillaries and the interstitium of these rodents, we used a data base bank of 1142 electron micrographs of rats (control/exposed to varying amounts of DE for the given time periods) and 250 micrographs of the guinea pigs chronically exposed to DE exhaust and the companion controls. Analysis was performed using a Zeiss MOP 3 Digital Analyzer yielding volume densities that were entered into a computer program for computation thereby enabling us to determine if a significant difference existed between the two populations using the standard t test.

RESULTS AND DISCUSSION

Quantitation and identification of cellular components of the alveolar capillaries revealed no significant difference between the control and the exposed animals. It was thus illustrated that neither species reflected any reaction to the DE exhaust in this vascular area. And further that the increase of cells in the air spaces and tissues is exclusive of the cellular components of the alveolar capillaries.

One can comment on the area studied for this project (the alveolar wall). This selected site appears not to have been advantageous to identify the existing white blood cell traffic. The better tissue selection would have been to examine vessels at bronchiolar-alveolar junctions.

However, several positive findings regarding the interstitium can be made. The total interstitial cellular population is increased at the 10 week exposure with the predominant cell being the fibroblast. In comparing the chronically exposed rodents, both show a significant increase in cellular components with the mononuclear cell indicating a significant difference from the control animal (see Table I).

TABLE I COMPARISON OF EFFECTS OF DE EXPOSURE ON THE ABSOLUTE NUMBER OF INTERSTITIAL CELLS (IC) IN ALVEOLAR LUNGS (UNITS, MEAN ± SD)

	ABSOLUTE NUMBER OF CELLS		
CONDITIONS	TOTAL IC X 10^6	FIBROBLASTS X 10^6	MONONUCLEAR CELLS X 10^6
RATS			
2 wk C	468.4 ± 27.8	421.6 ± 25.0	46.8 ± 2.8
2 wk E[a]	517.7 ± 166.2	425.5 ± 136.6	92.1 ± 29.6*
6 wk C	480.2 ± 113.4	365.9 ± 101.7	114.3 ± 27.0
6 wk E[a]	561.4 ± 75.0	458.1 ± 61.2	103.3 ± 13.8
10 wk C	277.2 ± 134.6	204.3 ± 99.2	72.9 ± 35.2
10 wk E[a]	533.8 ± 55.9**	420.1 ± 44.0	113.7 ± 11.9
18 mo C	433.8 ± 192.8	319.7 ± 142.1	114.1 ± 50.7
18 mo E[b]	731.3 ± 133.7***	514.9 ± 94.1*	216.5 ± 39.6***
GUINEA PIGS			
18 mo C	1083.0 ± 171.0	468.9 ± 74.0	614.1 ± 97.0
18 mo E[b]	1618.0 ± 254.0***	637.5 ± 100.1*	980.5 ± 153.9***

Abbreviations: C-control E-exposed DE=Diesel Exhaust wk-week mo-month
m-metter a-exposed to 6000 μg/DE/M^3 b-exposed to 1500 μg/DE/M^3
Mononuclear cells include monocyte, macrophage, lymphocyte.
No neutrophils or eosinophils were seen.

* p · 0.10
** p - 0.06, marginally significant
*** p = 0.06, ≤ significant at the 95% level of confidence

Although no significant difference was demonstrated for fibroblast numbers it is evident that there is an increase trend from the 10 week on to the chronically exposed animals perhaps explaining the septal thickening noted by Barnhart et al in an earlier study. It is known that fibroblasts can be recruited by chemotactic products of the WBC population, thus explaining the increase in their numbers.

GRAFT VERSUS HOST DISEASE AND LYMPHOCYTOTOXIC ANTIBODIES IN BONE MARROW TRANSPLANT PATIENTS

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The first bone marrow transplant (BMT) was performed at The Ohio State University (OSU) in February, 1984. The protocol at OSU differs from other centers by not using total body irradiation. One of the most difficult problems encountered in BMT is graft versus host disease (GVHD). Although mild GVHD seems to have an anti-leukemic effect, severe GVHD is life threatening.

Multiple disciplines in the Divisions of Hematology and Transfusion Service, and at the American Red Cross Blood Services, are involved in the investigation of BMT patients. All patients at OSU are given Cyclosporine prophylactially for prevention of GVHD but, despite this, some patients develop the disease.

For this study the BMT team evaluated six patients (one aplastic anemia and five leukemic) who received an HLA identical BMT and later experienced GVHD. As part of the BMT protocol, the histocompatibility laboratory monitored the patients with weekly lymphocytotoxic (LCT) antibody screens through day 90. The results were used to help the blood center pheresis department provide HLA compatible plateletpheresis products for these patients. All six patients developed nonspecific LCT antibodies simultaneously with symptoms of GVHD.

Patient #1 received a BMT for acute myelogenous leukemia in first remission. The clinical course was benign until day 203 when he was admitted with malabsorption and symptoms of GVHD. The patient had developed some specific HBA antibodies during the second month post transplant but had no detectable LCT antibodies by day 95. When the patient was readmitted on day 200 with malabsorption and symptoms of GVHD, the LCT screen showed anti HLA as well as nonspecific reactivity although the patient had not been transfused for 109 days. The nonspecificity persisted through day 268 but had diminished significantly as did the GVHD.

Patient #2 who received a BMT for AML had negative LCT screens through day 90. No additional screens were performed until the patient was readmitted (day 329) with chronic GVHD. This result indicated nonspecific LCT antibodies. The patient responded to treatment and the screen became negative by day 438.

Patient #3 received a BMT for ALL in relapse and developed mild GVHD during the fourth week. LCT screens had been negative but on day 26 showed nonspecific reactivity. GVHD resolved quickly and reactivity was 6% by day 33. Again mild GVHD developed during the eighth week and the LCT screen showed nonspecific reactivity.

Patient #4 received a BMT for aplastic anemia and had a negative LCT screen through day 13. By day 15 there were strong LCT responses and mild GVHD had developed. The strongest responses were to Le^a positive panel members but in addition there was some nonspecific reactivity. The Le^a and other non-HLA antibodies persisted through day 34 but had diminished significantly as had the GVHD. By day 41 there was no evidence of GVHD and only Le^a antibody remained.

Patient #5 was transplanted for AML in relapse. Initially the screen was negative but later a nonspecific HLA B17 antibody developed which resolved by day 50. During the fifth month GVHD symptoms developed and the screen showed 78% reactivity, 23% of which was non-HLA. The GVHD began to resolve by day 157 and the screen decreased to 22% reactivity (14% nonspecific). By day 161 the screen was completely negative and there were no symptoms of GVHD.

Patient #6 received a BMT for CML and during the fourth week developed some nonspecific reactivity (10%) concurrent with skin GVHD. This had resolved by day 48 and the patient exhibited a specific HLA antibody which began decreasing during the 8th week. The screen was completely negative by day 116. Symptoms of GVHD began on day 244 and nonspecific reactivity was demonstrated on day 258 (no screens had been performed since day 200). The screen became negative by day 321 and the patient had only mild chronic GVHD.

The nonspecific activity seen in these patients appears to be related to GVHD. While some patients developed specific HLA antibodies, all of them displayed nonspecific LCT during episodes of GVHD. Immune complexes have been implicated in renal allograft rejection and these complexes may form in patients experiencing GVHD and cause nonspecific LCT reactivity. Possibly there is nonspecific stimulation of B cells during GVHD causing this phenomenon of LCT reactivity. Whatever the mechanism involved, the role of these antibodies in the GVHD process should be investigated further.

EPILOGUE: DISCUSSION AND PLANNING FOR AN ALLIED HEALTH RESEARCH CONSORTIUM

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The 1985 Collaborative Research Symposium culminated with a discussion about the benefits and likely success of an allied health research consortium. The following narrative was prepared before the Symposium as a reaction paper to guide the discussion for planning a consortium.

THOUGHTS FOR DISCUSSION

Background Information

In recent years, research in the allied health professions has become a priority issue across the nation. Educators and practitioners alike are obligated to investigate effectiveness and efficiency in teaching and the delivery of health care services. Many of the research initiatives in allied health education or clinical investigation can be strengthened by inter-institutional or interdisciplinary collaboration.

Collaborative research can be facilitated through the creation and operation of a consortium of institutions with allied health educational programs and/or service units. Voluntary participation in such a consortium would foster "horizontal building" research in which a single theoretical area can be studied by individuals investigating complementary pieces of the area. In addition, collaborative research through a consortium would foster "vertical building" in which the same questions or modifications of the questions are asked in two or more subsequent studies.

Questions to be Addressed

There are obviously many questions that can and need to be asked about the purpose, advantages, procedures, and likely success of an allied health research consortium. Some questions to help focus our preliminary discussion include:

1. What is the purpose of an allied health research consortium?
2. What are the advantages of voluntary participation in such a consortium?
3. How will the consortium be structured; how will it function?
4. What are the obligations of the consortium "Center" to consortium institution members?
5. What are the obligations of the consortium member institutions?

Rationale: Purpose and Strengths to be Realized

The purpose of the allied health research consortium is to facilitate: 1) identification of timely research questions; 2) application for external funding; 3) collaboration through intercollegiate and interdisciplinary research efforts; and 4) dissemination of research findings in a timely and functional manner.

Allied health research can be strengthened through the collaborative efforts of a consortium by: a) increasing the number of subjects available for study in a short period of time; b) enhancing the generalizability of data gathered at multiple institutions; c) maximizing the talent and resources of multiple institutions; and d) prompting direct replication or replication with expansion of existing studies. Beyond collaboration, the consortium can facilitate corroboration between an experienced investigator in a specific area and a new investigator in the same area. Applications for external funding should be strengthened for each institution participating in the consortium.

Structure and Process

The consortium would consist of a "Center", presumably housed at the School of Allied Medical Professions of The Ohio State University, and "member" institutions having one or more allied health education program, and/or one or more allied health service units. Participation will be strictly voluntary without financial obligation, with both the "Center" and "member institutions" participating in the development and implementation of mutual obligations. Leadership for the consortium will be provided by an executive committee composed of one representative from each of the participating institutions and the Center.

For each collaborative research project, an individual at any member institution can serve as the principal investigator with coinvestigators at the collaborating institutions. Any member institution can seek external funding on behalf of the consortium retaining the primary award at that institution and subcontracting with institutions of the coinvestigators.

Consortium "Center" Obligations

The consortium Center will serve as the communication resource center to help establish linkages between individuals in member institutions for collaborative research. Specific activities include, but are not limited, to:

1. Maintain a data base of consortium members' areas of past research (for corroboration) and current collaborative research interests.
2. Communicate among individuals from member institutions seeking corroborators or collaborators for specific research topics.
3. Identification of timely research initiatives.
4. Maintain progress reports on consortium collaborative research efforts.
5. Facilitate dissemination of completed collaborative research.

Consortium "Member" Obligations

Consortium member obligations include:

1. Provide a letter of agreement to participate in the consortium.
2. Identify an individual to serve as the spokesperson for the member institution.
3. Provide information about the member institution, individual areas of past research and current interests.
4. Participte in the development and on-going function of the consortium.

PLANS FOR IMPLEMENTATION

Several strategies were recommended as appropriate follow-up steps.

First, the Collaborative Research Symposium would be planned again for next year and hosted by The Ohio State University.

Second, several small groups of individuals would plan to do collaborative research along a specific theme. Suggestions included collaboration within an institution and interinstitutions, but would be initiated by individuals in the absence of a stuctured consortium.

Third, conveners of the Symposium would write to various Schools and Colleges of Allied Health, sharing with them the information described above, and inviting participation of their institution in a consortium.

Fourth, external funding would be sought to cover the administrative costs of operating an allied health research consortion.

And finally, the opportunity for a mid-year gathering of individuals interested in designing and developing collaborative research would be investigated.

APPENDIXES

A. Interview Format/Data Collection Instrument

B. Life Management Self-Evaluation Test

C. Instrument for Survey of Clinical Affiliation Sites

D. Survey of Research Interests of Clinical Dietitians

E. Speech Language Pathology and Medical Record Administration Joint Project Questionnaire

F. Health Promotion and Disease Prevention - WCMH Laboratory Project Consent Form

G. Laboratory In-Service Education

H. Bibliography: Computers and Informatics in Health Care and Education

APPENDIX A

INTERVIEW FORMAT/DATA COLLECTION INSTRUMENT

W. F. Dorian and P. D. Douglas

Date:
Interviewer:
Person interviewed:

Course (name & number):

Semester last given:

# hours in whole course:

Health promotion/Disease prevention

1. Do you talk about the concept of "wellness" as it relates to illness?

   yes no # hours: ______

   Do you assign any readings on this? no yes (MARK "1" ON SYLLABUS)

   Have you had any student projects in this area? no yes (describe)

2. Do you spend class time on disease prevention? no yes

   # hours: _____

   Do you assign any readings on this? no yes (MARK "2" ON SYLLABUS)

   Have you had any student projects in this area? no yes (describe)

3. Does this course include general skills that would be related to health promotion/disease prevention? For example, we have this list of skills. Perhaps you could think of others...

skills	yes	no	# hours?
counseling			
behavior modification			
education			
assessment			
marketing			
advocacy			
other (specify)			

High blood pressure control

4. Does this course include any material on high blood pressure control? You can use this list as a guide for content and just give me the letters and numbers...(HAND LIST)

5. How many hours overall would you say are related to high blood pressure control?

______

6 What readings are assigned on this topic? (MARK WITH "6")

7. Were there any student projects related to this? no yes (describe)

Smoking and Health

8. Does this course include any material on smoking and health? You can use this list as a guide for content and just give me the letters and numbers... (HAND LIST)

9. How many hours overall would you say are related to smoking and health?

______

10. What readings are assigned on this topic? (MARK WITH "10")

11. Were there any student projects related to this? no yes (describe)

Nutrition

12. Does this course include any material on nutrition? You can use this list as a guide for content and just give me the letters and numbers... (HAND LIST)

13. How many hours overall would you say are related to nutrition?

______

14. What readings are assigned on this topic? (MARK WITH "14)

15. Were there any student projects related to this? no yes (describe)

Physical fitness and exercise

16. Does this course include any material on physical fitness and exercise? You can use this list as a guide for content and just give me the letters and numbers...(HAND LIST)

17. How many hours overall would you say are related to physical fitness and exercise?

    ____

18. What readings are assigned on this topic? (MARK WITH "18")

19. Were there any student projects related to this? no yes (describe)

Stress control

20. Does this course include any material on stress control? You can use this list as a guide for content and just give me the letters and numbers... (HAND LIST)

21. How many hours overall would you say are related to stress control?

    ____

22. What readings are assigned on this topic? (MARK WITH "22")

23. Were there any student projects related to this? no yes (describe)

24. Overall, are you satisfied with the amount of material now in this course on health promotion/disease prevention? no yes

25. Do you plan to add more? no yes (describe what, when, etc.)

APPENDIX B

LIFE MANAGEMENT SELF-EVALUATION TEST

Cited by
J. P. Cornish
W. F. Dorian
P.D. Douglas

My Nutrition

I feel I overeat:

Usually	0
Occasionally	1
Rarely	3

At the table, I salt my food:

Usually	0
Occasionally	1
Rarely	3

My daily sugar substitute servings are:

Three or more	0
One or two	1
None	3

My total weekly egg consumption in all food is:

Ten or more	0
Eight or nine	1
Seven or less	3

My cereal consumption consists of:

Boxed cereals, presweetened	0
Vitamin enriched (with extra roughage)	1
Whole grain	3

My daily tea consumption is:

Five or more cups	0
Two to four cups	1
Two cups or less	3
Herbal tea	3

I use:

Butter	0
Soft or liquid margarine (or none)	3

Meat in my diet consists mainly of:

Fatty meats (untrimmed marbled beef, bacon, luncheon meats	0
Meats (lean beef & pork, veal, chicken, turkey, and fish cooked with skin	1
Lean meats (fish, chicken, turkey cooked without skin)	3
No meat at all	3

I have indigestion:

Usually	0
Occasionally	1
Rarely	3

My refined sugar & sweet food consumption is:

Average or above	0
Less than average	1
Very low	3

My daily alcohol consumption is

Three or more drinks	0
Two	1
One	2
None	3

My bread consumption consists of:

Whte	0
Light brown/wheat	1
Whole wheat	3

My daily soft drink (8 oz.) is:

Three or more	0
One or two	1
None	3

My daily coffee consumption is:

Four or more cups	0
Two or three cups	1
Decaffeinated	2
One cup or less	3

My daily roughage intake consists consists of:

Normal diet	0
Extra salad & raw vegetables	1
Extra source of fiber once or twice a day	3

The dairy products in my diet are mostly:

Whole milk/cream products (include most cheeses) or imitation dairy products or coconut oil	0
Low-fat dairy products	1
Skim milk or no dairy products, low-fat cheeses, low-fat yogurt	3

My nutrition score is _____

My Exercise, Occupation, Recreation, and General Fitness

My exercise program consists of:

Little or no exercise	0
Walking program three or more days per week	1
Easy to moderate exercise in exercise attire three or more days per week	2
Fairly vigorous exercise in exercise attire three or more days per week	5
Heavy exercise in exercise attire three or four days per week	8
Heavy exercise in exercise attire five to seven days per week	10

My occupational activities consist of:

Mostly mental activity with little or no manual labor	0
Combination of mental and manual labor	2
Mostly manual labor (I perspire from my work)	4

My recreational activities and hobbies consist of

Gardening, doubles tennis, sailing, reading, and other sedentary activities	0
Singles tennis, hiking, light bicycling and other moderately fatiguing activities	2
Prolonged and fatiguing physical activities	4

Weight

The average person in good physical condition reaches a desirable weight between the ages of 18 and 23. Comparing your weight then and now, you are presently:

10	9	7	5	2	0	-2	-4	-6	-8	-10
At or below that weight	1-3 over	4-6 over	7-10 over	11-15 over	16-20 over	21-30 over	31-40 over	41-50 over	51-75 over	76 or more over

If you have always been overweight, circle how many pounds overweight you now are.

Systolic blood pressure

	-5	-3	-2	-1	1	4	6	7	8	9	10
Male	180	160	150	140	135	130	125	121	118	115	110
Female, premenopause	177	157	147	137	132	127	122	119	116	113	108
Female, postmenopause	184	164	154	144	139	134	129	125	122	118	113

If not known, check here and circle 4.

Diastolic blood pressure

Male	99	96	93	90	88	84	80	75	70	68	65
Female, premenopause	99	95	90	88	86	83	78	73	68	66	63
Female, postmenopause	99	97	95	92	88	86	82	76	73	68	65

If not known, check here and circle 4.

My total fitness score is ____.

My Personality and How I Handle Stress

I am anxious/nervous:

Often	0
Occasionally	1
Seldom	3

When confronted with a situation that bothers or angers me:

I keep it to myself	0
I may or may not say something	1
I always say something about it	3

Criticism or scolding bothers me:

Greatly	0
Moderately	1
Hardly at all	3

I have spells of the blues:

Often	0
Occasionally	1
Rarely	3

People disappoint me:

Often	0
Occasionally	1
Rarely	3

In my own work, I am confronted with making important decisions:

Often	0
Occasionally	1
Seldom	3

I am sexually frustrated:

Often	0
Occasionally	1
Rarely	3

I would describe myself as:

Highly competitive	0
Moderately competitive	1
Not competitive	3

I go out of my way to avoid unpleasant acquaintances:

Often	0
Occasionally	1
Rarely	3

In my work, success is:

Very important	0
Moderately important	1
Not important	3

I have disturbed sleep:

Often	0
Occasionally	1
Rarely	3

I am depressed:

Often	0
Occasionally	1
Rarely	3

"Our country is going to the dogs" is a statement with which I:

Agree greatly	0
Agree moderately	1
Agree hardly at all	3

I am secretive:

Greatly	0
Moderately	1
Hardly at all	3

My personality/stress score is _____

My Lifestyle
Basic Information About Myself

I have worked in a smoky office for 16 or more years	-3
I have worked in a smoky office for 10-15 years	-2
I have worked in a smoky office for 1-9 years	-1
I have lived in a smoggy area such as Los Angeles for 10 or more years	-2
I have lived in a smoggy area such Los Angeles for 1-9 years	-1
I have had emphysema (breathing obstruction) for 10 or more years	-3
I have had emphysema for 1-9 years	-1

I have had a heart attack or heart disease	-10
I have not had a heart attack or heart disease, but have had heart or chest pain (angina)	-5
I have or have had diabetes	-5
I have or have had kidney disorders	-3
I have or have had thyroid conditions	-3
I have or have had gout	-3
I have or have had leg cramps or claudication	-2

Smoking and Pulmonary Status

If you smoke:

Over 30 cigarettes per day (or inhale pipe/cigar)	-15
21-30 cigarettes per day	-10
10-20 cigarettes per day	- 8
1-9 cigarettes per day	- 5
Over 2 cigarettes per day (or pipe/cigar, but not inhale)	- 3

If you quit smoking:

20 or more cigarettes per day (or inhaled pipe/cigar but quit less than 5 years ago	1
19 or less cigarettes per day, but quit less than 5 years ago	2
20 or more cigarettes per day, but quit 5-10 years ago	3
19 or less cigarettes per day, but quit 5-10 years ago	5
20 or more cigarettes per day, but quit over 10 years ago	6
5-19 cigarettes per day, but quit over 10 years ago	10

If you have never smoked:

Never smoked, but lived with a tobacco smoker for more than 10 years	7
Never smoked, but lived with a tobacco smoker for less than 10 years	8
Never smoked or lived with a smoker	10

Age

Female		Male	
79 or over	3	72 or over	3
78-75	2	71-68	0
74-70	1	67-64	1
69-66	0	63-61	2
65-60	2	60-57	3
59-54	4	56-54	4
53-46	6	53-49	5
45-38	7	48-44	6
37-30	8	43-40	7
29-21	9	39-35	8
20/under	10	34-21	9
		20/under	10

My total lifestyle score is____

My total score (nutrition, fitness, personality/stress, and lifestyle is _____

Gender

Male, stocky, bald	0	Female, 55 or over	7
Male, stocky	1	Female, 54-50	8
Male	2	Female, 49-36	9
		Female, 35 or under	10

Family History

I have the following number of relatives (parents and grandparents) who had heart disease, stroke, or circulatory disorder which occurred between the the indicated ages:

1 or more under age 50	0
2 or more between 50-60 years	1
1 between 50-60 years	2
2 over 60 years	3
1 over 60 years	5
None	10

How Does your Wellness Add Up?

Extremely dangerous health risk	50 & below
Dangerous health risk	51-60
Poor health risk	61-70
Unsatisfactory health risk	71-80
Satisfacory health risk	81-90
Very good, low health risk	91-100
Excellent, very low health risk	101-120
Exceptionally low health risk	Over 120

The score you achieve on this test is not a guarantee that you are absolutely a "high" or "low" health risk, since such scores are a result of statistical averages regarding various health risk factors. Your score will, however, give you a good idea of how you compare to others and where you need to concentrate your efforts at improving your health and fitness lifestyle.

This test is adapted from a risk analysis developed by Howard F. Hunt, Ph.D., and James R. White, Ph.D. at the University of California, San Diego. It appeared in The Blue Cross and Blue Shield Guide to Staying Well.

APPENDIX C

HEALTH PROMOTION

The University of Connecticut
School of Allied Health Professions
Box U-101
Storrs, CT 06268

INSTRUMENT FOR SURVEY OF CLINICAL AFFILIATION SITES

W. F. Dorian and P. D. Douglas

1. Do you feel that you need or are interested in continuing education in the area of health promotion? If so, please check your interest area(s) below and specify type of programs, if possible (eg credit or non-credit course, one-day workshop, lectures, consultative services readings, etc.).

check		specify type of program
____	Physical Fitness & Exercise	
____	Smoking & Health	
____	High Blood Pressure Control	
____	Nutrition	
____	Stress Management	
____	Other	

2. If you have a specific area of expertise in health promotion, would you be interested in helping to develop health promotion seminars and workshops?

____ Yes ____ No ____ Possibly

Area of Expertise ____________________

3. Does your facility or department currently sponsor or participate in any programs in the area of health promotion and disease prevention (outside of conventional treatment)? Please use the checklist below to indicate the type of program(s) and participants.

Program	Patient	Community	Staff	Other
Physical Fitness & Exercise				
Smoking and Health				
High Blood Pressure Control				
Nutrition				
Stress Management				
Other				

4. Do physical therapy students who currently affiliate at your facility have the opportunity to become involved in any of your health promotion programs as part of their student experiences?

_____ Yes   _____ No

a) If yes, please indicate which programs the students have been involved in and briefly describe their roles in the programs. (eg assist with teaching, coordination, patient counseling, etc.)

b) If no, do you feel that senior level physical therapy students could become involved in your health promotion programs?

_____ Yes   _____ No   _____ Possibly

Please indicate which programs may have potential for student involvement and briefly describe the student's possible roles. (eg assist with teaching, coordination, patient counseling, etc.)

Date ______________________________

Name______________________________

Title______________________________

Facility____________________________

THANK YOU FOR YOUR ASSISTANCE

Please feel free to add any other comments or suggestions you may have.

Please return by June 1st. Thank you.

Appendix D
M. Rosita Schiller

Survey of Research Interests of Clinical Dietitians

DEMOGRAPHIC INFORMATION

1. How long have you been a member of ASPEN?
   _____ Number of years

2. Did you attend the ASPEN Clinical Congress in
   1984? _____ Yes _____ No
   1985? _____ Yes _____ No

3. Are you (have you ever been) a member of the ADA Dietetic Practice Group Dietitians in Critical Care?
   _____ Yes
   _____ No

4. What is your highest level of education?
   _____ Bachelor of Science Degree
   _____ Masters Degree in progress
   _____ Masters Degree completed
   _____ Doctorate in progress
   _____ Doctorate completed

5. How did you complete your entry-level education/experience requirements?
   _____ Coordinated Undergraduate Program
   _____ Bachelors Degree (Plan IV) plus Dietetic Internship
   _____ Master of Science Degree plus 6 months experience
   _____ Master of Science Degree with Assistantship
   _____ Other (please specify)_________________________

6. What research-related courses did you complete? (Please check all that apply)
   _____ One or more Undergraduate course(s) in statistics
   _____ One or more Graduate course(s) in statistics
   _____ One or more Undergraduate course(s) in research methodology
   _____ One or more Graduate course(s) in research methodology
   _____ Other (please specify)_________________________

7. In your formal education what research experiences did you have? (Please check all that apply)
   _____ Undergraduate research project
   _____ Masters Thesis
   _____ Masters "Project" (non-thesis)
   _____ Internship research project
   _____ Doctoral Dissertation
   _____ Other (please specify)_________________________
   _____ None

8. Are you currently part of a Nutrition Support Team?
   _____ Yes _____ No

   If not, have you previously been a member of a Nutrition Support Team?
   _____ Yes _____ No

9. If you responded to the preceding question(s) affirmatively, who coordinate(s/d) the Team?
   _____ Physician
   _____ Pharmacist
   _____ Nurse
   _____ Dietitian
   _____ Rotating coordinator among Team members
   _____ No formal team coordinator

INVOLVEMENT IN RESEARCH ACTIVITIES

10. On an average, approximately how much time per week do you spend in research-related activities?
    _____ Total number of hours

11. Given your personal interests and current responsibilities, would your preference be to
    _____ spend less time in research activities?
    _____ spend more time in research activities?
    _____ keep research time as it is?

12. Indicate the number of clinical research projects in which you participated during the past two years:
    _____ number as principal investigator
    _____ number as co-investigator
    _____ number for which you collected data for other investigators

13. During the past two years, for how many research proposals or articles did you survey the current literature?
    _____ as principal investigator or first author
    _____ as co-investigator or co-author
    _____ to assist others in their projects; not listed as an author

14. During the past two years how many research proposals did you write?
    _____ as principal investigator or first author
    _____ as co-investigator or supportive author

15. How many research projects did you have approved in the past two years?
    As principal investigator:
    _____ approved with funding
    _____ approved without funding
    As co-investigator:
    _____ approved with funding
    _____ approved without funding

16. In the past two years how many times have you presented at national or state meetings or conferences?

	Number of presentations
Symposium/Major Session (non-research)............	_____
Major Scientific/Research Paper..................	_____
Poster Session...................................	_____
Case Study/Brief Presentation....................	_____
Round Table......................................	_____
Other (please specify)	_____

17. Have research articles been published (or accepted for publication) in which you were the primary or supporting author?
_____ Yes How many as primary author?_____
_____ No How many as supporting author?_____

18. Have you been the primary or supporting author of other research-related publications such as abstracts or review articles?
_____ Yes How many total?_____
_____ No

RESEARCH INTERESTS AND NEEDS

19. Would you be interested in collaborative research studies?
_____ Yes _____ No

20. If you answered the previous question affirmatively, do you see yourself as having the interest and skills to (please check)
_____ serve as an organizer and take responsibility for proposal writing and implementation?
_____ serve as co-investigator, help design studies and assist with proposal writing?
_____ collect data as requested by other investigators?

21. What are your research interests?
_____ Metabolic studies (laboratory indexes used)
_____ Intake studies
_____ Clinical studies (non-metabolic)
_____ Survey studies
_____ Education studies
_____ Other (please specify)_____

22. How would you assess your research skills?

	Adequate	Needed
Identifying research problems	_____	_____
Defining the research objectives	_____	_____
Data collection	_____	_____
Statistical analysis of data	_____	_____
Developing a research design	_____	_____
Writing protocols	_____	_____
Writing a proposal	_____	_____
Getting funded	_____	_____
Writing the paper or abstract	_____	_____
Getting the paper published	_____	_____
Presenting the paper	_____	_____
Other needed skills (please specify)_____		

23. What research-related continuing educational activities would be of interest to you?
_____ Correspondence course in Research Fundamentals
_____ Postgraduate course at national meetings of ASPEN or ADA
_____ Regional Seminars
_____ Self-instructional module
_____ Consultation service to assist with writing proposals/papers
_____ Other (please specify)_____

RESEARCH ENVIRONMENT

24. How would you characterize the research environment at your place of work? Place an "X" in the appropriate space on the continuum below:

Positive Aspect		Negative Aspect
Research activities are rewarded.	!__!__!__!__!__!__!__!	Research activities are not rewarded.
Research is given high priority.	!__!__!__!__!__!__!__!	Research is low priority.
Professional resources are available.	!__!__!__!__!__!__!__!	Professional resources are limited.
I have a personal interest in research.	!__!__!__!__!__!__!__!	I am not interested in research.
There are many research opportunities.	!__!__!__!__!__!__!__!	Research opportunities are lacking.
There is computer accessibility.	!__!__!__!__!__!__!__!	Computer availability is lacking.
Research is financially and administratively supported.	!__!__!__!__!__!__!__!	Research is not supported.
Dietetics department supports research	!__!__!__!__!__!__!__!	Dietetics department is not supportive of research
My coworkers encourage research involvement.	!__!__!__!__!__!__!__!	Colleagues ignore research involvement.
Statistical services are available.	!__!__!__!__!__!__!__!	Statistical services are lacking.

Comments:

THANK YOU FOR YOUR TIME AND COOPERATION!

M. Rosita Schiller, Ph.D., R.D.
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The Ohio State University
1583 Perry Street
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Deadline: May, 21, 1985

Appendix E

SPEECH LANGUAGE PATHOLOGY & MEDICAL RECORD ADMINISTRATION
JOINT PROJECT QUESTIONNAIRE

L. George Van Son and
Susan Pritchard Bailey

5 = agree entirely
4 = agree somewhat
3 = neither agree or disagree
2 = disagree somewhat
1 = disagree entirely

1.	I understand the nature of my partner's profession, its roles and functions.	5	4	3	2	1
2.	I understand my part of the assignment.	5	4	3	2	1
3.	I understand the contribution which I will need from my partner in order to complete my part of the project.	5	4	3	2	1
4.	I believe my partner understands what I need from him/her in order to complete my part of the project.	5	4	3	2	1
5.	I understand what my partner needs from me to complete his/her part of the project.	5	4	3	2	1
6.	I believe that my partner understands what he/she needs from me in order to complete his/her part of the project.	5	4	3	2	1
7.	At this point, I am nervous about how well I can complete my part of the project.	5	4	3	2	1
8.	At this point, I am confident that I can supply the information my partner needs to complete his/her part of the project.	5	4	3	2	1
9.	I am working well with my partner: we are communicating to my satisfaction.	5	4	3	2	1
10.	I am having difficulty explaining things to my partner in such a way that I believe he/she understands what I am trying to say.	5	4	3	2	1
11.	I have confidence in my partner's expertise and knowledge of his/her profession.	5	4	3	2	1
12.	I am having difficulty meeting with my partner.	5	4	3	2	1
13.	My partner is helping me gain confidence about how successful we will be with this project.	5	4	3	2	1

14. I am learning very little at this point as a result of doing this project. 5 4 3 2 1

15. My respect for my partner's profession has increased as a result of doing this project. 5 4 3 2 1

16. I am having difficulty deciding what is or is not important regarding the content or format of the forms. 5 4 3 2 1

17. This assignment should not be evaluated by a letter grade. 5 4 3 2 1

18. There should be more class time spent in explaining the assignment. 5 4 3 2 1

19. The instructions regarding the specific requirements were adequate. 5 4 3 2 1

20. Comments:

Appendix F

HEALTH PROMOTION AND DISEASE PREVENTION-
WCMH LABORATORY PROJECT CONSENT FORM

J. P. Cornish

I, ____ hereby consent to my

participation in the following research project

____

Project Director: James P. Cornish, Ph.D., MT(ASCP)SH

Sponsors -
Department -

I hereby acknowledge that I have orally received from the Project Director the following:

1. A full explanation of the procedures to be followed and their purposes, including an identification of those which are experimental.
2. A description of the attendant discomforts and risks.
3. A description of the benefits to be expected from the project.
4. A disclosure of appropriate alternative procedures that might be advantageous to me.
5. An offer to answer any inquiries concerning procedures. (see accompanying list of Advisory Health Team Network members).
6. A statement that I am free to withdraw my consent and to discontinue participation in the project at any time, without prejudice to myself.

Because of the proven techniques to be used in this project, physical injury should not result. However I understand that I may discuss this question with the project director or his designee.

I have read the above statement, understand the same, and voluntarily sign this form. I further acknowledge that I have received a copy of this form dated this ____ day of ______________. 1984, at Windham Community Memorial Hospital.

____
Signature of Subject

____
Signature of witness to the oral presentation and to subjects' signature.

____
Signature of Project Director

APPENDIX G

LABORATORY IN-SERVICE EDUCATION

J. P. Cornish, Ph.D.

HEALTH PROMOTION PROJECT

September 6, 1984	"Health Promotion and Disease Prevention"	J. Cornish, Ph.D.
September 27, 1984	"Health Promotion and Disease Prevention-Repeated"	J. Cornish, Ph.D.
November 1, 1984	"Life Habits" Film on Health Promotion	J. Cornish, Ph.D.
November 29, 1984	"Lipids: Too Fat or not Too Fat"	V. Bradley, M.T. Chemistry
December 13, 1984	"Behavior Modification: A Need for Many"	Cindy Adams, Ph.D. Clin. Psychologist
January 10, 1985	"Nutrition and Health Promotion-Part I"	Lynn Cyr, R.D. Lori Schwartz, R.D.
January 17, 1985	"Nutrition and Health Promotion-Part II"	Lori Schwartz, R.D. Lynn Cyr, R.D.
January 29, 1985	"The Art of Exercise and Fitness-Part I for Laboratory Personnel"	Brian Cawley, RPT L. Ferguson, RPT
January 31, 1985	"The Art of Exercise and Fitness for Laboratory Personnel - Part 2"	B. Cawley, RPT L. Ferguson, RPT
February 7, 1985	"Nutritional Science-Consumerism"	Ken Davidsohn Paula Moffatt Linda Shields
February 28, 1985	"A New Technique for Success"	J. Cornish, Ph.D.
May 16, 1985	"Behavior Modification and Weight Reduction"	Simone Adams, Ph.D. Nutritionist
May 23, 1985	"Critical Elements - Where are We?"	J. Cornish, Ph.D.
	"Aerobic Exercise"	Mary Withey, R.N.
September 13, 1985	"The Clinician's Approach to Risk Factors"	M. Kilgannon, M.D.

APPENDIX H

Francine Sevel, Ph.D.
School of Allied Medical Professions
The Ohio State University

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THE OHIO STATE UNIVERSITY
SCHOOL OF ALLIED MEDICAL PROFESSIONS

COLLABORATIVE RESEARCH IN ALLIED HEALTH SYMPOSIUM
September 20, 1985

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